

AMERICAN
JOURNAL OF INSANITY,
FOR APRIL, 1869.

CH. BOUCHARD ON SECONDARY DEGENERATIONS OF THE SPINAL CORD.

(Continued from January Number.)

OF THE PROXIMATE CAUSE OF SECONDARY DEGENERATIONS.

We have already demonstrated that inflammation plays no part in the production of secondary degenerations of the white fibres of the cord; it only supervenes consecutively, if we may give the name of inflammation to that slow production of connective tissue which produces, so to speak, the cicatrization of the degenerated column. We have established the fact that the first alteration affects the nerve tubes which undergo a granulo-fatty transformation analogous to that which has been observed in the peripheral portion of divided nerves. We have shown the analogy of this destruction of the nervous elements of the cord with that which is observed in cerebral softening from vascular obstruction, and we can now affirm the identity of the destructive process in secondary degenerations, and in degenerations of the nervous centres depending on arrest of the arterial circulation. In both cases there are found, after the first few days, granular bodies and a great abundance of fatty molecular granulations; the origin of these elements appears to be, in the softening as well as in the secondary degenerations, a destructive alteration of the

nerve tubes. Some months since, I had an opportunity of observing with M. Charcot, in two cases of recent cerebral softening, the granulo-fatty infiltration of the cylinders of myeline of several tubes taken from the very seat of the softening, and presenting the same characters as those which I had been able to find at the commencement of secondary degenerations. But, when it is the result of a loss of the supply of blood, this destructive process seems to progress with more rapidity; it is for this reason that MM. Prevost and Cotard* have, in their experiments, been able to find numerous fatty granulations thirty-seven hours, and granular bodies three days, after the obliteration of a cerebral artery. They have also seen an atheromatous condition of the capillaries developed in points where they artificially produced a softening by cutting off the supply of blood. I have recognized in man, in a certain number of softenings from arterial obliteration, that this atheromatous condition of the capillaries is, as in secondary degenerations, only an atheromatous appearance; the fatty granulations are, outside of the proper wall of the vessel, accumulated between that membrane and the lymphatic sheath. Finally, as the last analogy, let us state that, in softening from a defective supply of blood, as well as in secondary degenerations, a proliferation of connective tissue usually follows the destruction of the nervous elements, in that period of cicatrization of which M. Durand-Fardel has given so excellent a description.

Thus the same disturbance of nutrition producing a necrobiotic destruction of nerve tubes may be produced under the influence of two different causes, the loss of the supply of blood and the loss of nutritive action.

* Société de biologie, janvier, 1866. (Gaz. Méd. de Paris, 1866, *passim.*)

By the loss of nutritive action, we understand the cessation of the influence which the elements of the gray substance exercise on the nutrition of the nerve tubes, thus admitting the conclusions to which his experiments on the degenerations of the nerves have conducted A. Waller. We know that according to this physiologist, each tube of the peripheral nerves has at one of its extremities a nervous cell, which, independently of its special properties of innervation, has the function of presiding over the nutrition of the nerve tube which departs from it, and even of contributing by a peculiar influence to the reproduction of this tube, when it becomes degenerated at some point of its course.* These cells Waller has designated under the name of neurogénotrophes; we now call them more simply *cellules-trophiques*, (nutritive cells.)

I cannot here refrain from examining an opinion which would tend to throw doubt upon the existence of these nutritive cells, or rather to deny the nutritive action which the nervous cells can exert upon the nerve tubes which arise from them. Under this hypothesis, the fatty degeneration of the nerve tubes could only be attributed to functional inertia. Reciprocally, if we admit that functional inactivity is capable of producing degeneration of nerve fibres, it is useless to accord to the central

* We should perhaps say with more precision at this time, that the centres exert a certain influence on the restoration and not on the regeneration of nerve tubes. It seems to result from the researches of M. Schiff, and of MM. Philipeaux and Vulpian, that the return of the functions of a divided nerve is produced, not by the production of new tubes in the midst of the débris of the degenerated tubes, as Waller thought, but rather by the reforming of the white substance of Schwann in the sheath of old tubes, around the axis-cylinder which, according to the same experiments, may remain for a long time, notwithstanding that it undergoes alterations which we are far from understanding.

elements any influence whatever upon the nutrition of the tubes; this property would be superfluous, and for the cord, would cease to be demonstrable. Let us consider, then, whether the facts known up to this day permit us to admit that the nerve tubes can degenerate from the sole fact of functional inactivity.

If we cut a mixed nerve, the central extremity remains healthy; on the contrary the peripheral end degenerates, and the alteration implicates all the fibres, sensor and motor. If we consider only the motor fibres, the degeneration affects in truth only the trunk of those fibres, which no longer receives any impulse from the brain or the cord, which are consequently in a state of functional inactivity. It is the same when we divide the anterior roots; the extremity attached to the cord, and which receives from it motor excitation, remains healthy; the peripheral extremity, which no longer participates in this excitation, degenerates. Thus far nothing proves that the functional inactivity may not be the cause of the degeneration.

In the section of a mixed nerve, we have said, all the fibres, and in particular the sensitive fibres, degenerate in the peripheral end; nevertheless, in this portion separated from the centre, they continue to undergo the excitations of contact, of temperature, &c.; they receive impressions which they cannot transmit to the centres; but the proper activity of the nerve tubes is put in play, notwithstanding which these tubes degenerate. On the contrary, the central end, which is certainly removed from all peripheral excitation, which is in the most complete functional inactivity, remains healthy. Now make a section in the middle of the posterior roots, and the degeneration affects the central extremity, the one which is attached to the cord, and which is in functional inactivity, and is entirely absent in the peri-

peripheral extremity which is in connection with the intervertebral ganglion, and which continues to receive external excitations. Thus, of the sensor fibres, the degeneration attacks sometimes those which are in functional inactivity, and sometimes those whose physiological activity continues to be provoked, and *vice versa*. The functional inactivity then exercises no influence over the degeneration of sensor fibres. The degeneration affects only those portions which have lost their relations with the ganglia of the posterior roots, the central or medullary extremity of the posterior roots, and the peripheral ends of nerves.

The condition of integrity of a sensor fibre is therefore neither in the fibre itself, nor in its peripheral extremity which receives the excitations, nor in the cord: it is in the intervertebral ganglion, or, according to the opinion of M. Schiff, near this ganglion.

If the functional inactivity is without influence upon the degeneration or the integrity of the sensor fibres, we may, without pushing the analogy, admit that it is the same for the motor fibres. We then have the right to state that the condition of integrity of a motor fibre is in the cord.

For ease of expression, we may translate these two propositions in the following manner: in nerves, the motor fibres have their nutritive cells in the cord, the sensor fibres have their nutritive cells in the ganglia of the posterior roots.*

If the integrity of the tubes of the peripheral nerves is due to the nutritive centres and not to the alternations

* This word nutritive cells expresses more than our actual knowledge allows us to affirm, and perhaps it would be preferable to speak only of the nutritive elements, or still better of the nutritive centres. It is not demonstrated, in fact, that all the nerve tubes owe to their connection with a nerve cell all the nutritive activity necessary to the integrity of their structure. As regards the posterior

elements any influence whatever upon the nutrition of the tubes; this property would be superfluous, and for the cord, would cease to be demonstrable. Let us consider, then, whether the facts known up to this day permit us to admit that the nerve tubes can degenerate from the sole fact of functional inactivity.

If we cut a mixed nerve, the central extremity remains healthy; on the contrary the peripheral end degenerates, and the alteration implicates all the fibres, sensor and motor. If we consider only the motor fibres, the degeneration affects in truth only the trunk of those fibres, which no longer receives any impulse from the brain or the cord, which are consequently in a state of functional inactivity. It is the same when we divide the anterior roots; the extremity attached to the cord, and which receives from it motor excitation, remains healthy; the peripheral extremity, which no longer participates in this excitation, degenerates. Thus far nothing proves that the functional inactivity may not be the cause of the degeneration.

In the section of a mixed nerve, we have said, all the fibres, and in particular the sensitive fibres, degenerate in the peripheral end; nevertheless, in this portion separated from the centre, they continue to undergo the excitations of contact, of temperature, &c.; they receive impressions which they cannot transmit to the centres; but the proper activity of the nerve tubes is put in play, notwithstanding which these tubes degenerate. On the contrary, the central end, which is certainly removed from all peripheral excitation, which is in the most complete functional inactivity, remains healthy. Now make a section in the middle of the posterior roots, and the degeneration affects the central extremity, the one which is attached to the cord, and which is in functional inactivity, and is entirely absent in the peri-

pheral extremity which is in connection with the intervertebral ganglion, and which continues to receive external excitations. Thus, of the sensor fibres, the degeneration attacks sometimes those which are in functional inactivity, and sometimes those whose physiological activity continues to be provoked, and *vice versa*. The functional inactivity then exercises no influence over the degeneration of sensor fibres. The degeneration affects only those portions which have lost their relations with the ganglia of the posterior roots, the central or medullary extremity of the posterior roots, and the peripheral ends of nerves.

The condition of integrity of a sensor fibre is therefore neither in the fibre itself, nor in its peripheral extremity which receives the excitations, nor in the cord: it is in the intervertebral ganglion, or, according to the opinion of M. Schiff, near this ganglion.

If the functional inactivity is without influence upon the degeneration or the integrity of the sensor fibres, we may, without pushing the analogy, admit that it is the same for the motor fibres. We then have the right to state that the condition of integrity of a motor fibre is in the cord.

For ease of expression, we may translate these two propositions in the following manner: in nerves, the motor fibres have their nutritive cells in the cord, the sensor fibres have their nutritive cells in the ganglia of the posterior roots.*

If the integrity of the tubes of the peripheral nerves is due to the nutritive centres and not to the alternations

* This word nutritive cells expresses more than our actual knowledge allows us to affirm, and perhaps it would be preferable to speak only of the nutritive elements, or still better of the nutritive centres. It is not demonstrated, in fact, that all the nerve tubes owe to their connection with a nerve cell all the nutritive activity necessary to the integrity of their structure. As regards the posterior

of activity and repose, we are right in supposing that it is the same for the tubes of the cord, and that the degenerations which we have studied are due, not to the functional inactivity, but to the suppression of the action of the nutritive elements. Here experimental demonstration is impossible. In truth, in the cord, contrary to that which we have seen for the sensor fibres of the peripheral nerves, the degeneration of the tubes is produced always in the direction of their physiological activity. The antero-lateral columns, which conduct centrifugal excitations, degenerate below the point injured, that is to say, in the portion which is no longer excited; the posterior columns, whose conductivity is centripetal, alter above the point injured, in the portion which is thus reduced to functional inactivity.

But, to place a column of the cord in a state of inaction, it is not necessary to produce a lesion of the column itself; we equally produce a functional inactivity of the fibres of the cord having a centripetal current, by destroying in the peripheral nerves the elements which connect mediately with them. This experiment is realized in amputations. Now, never, as a result of an amputation of the thigh, which nevertheless places in the most absolute inactivity all the fibres which were intended to transmit to the cord, and thence to the brain, the excitations coming from the lower limb, never, I say, has a degeneration been found of the posterior part of the lumbar enlargement, nor of any point of the posterior columns. This observation has already been made by L. Türck. In these cases, the fibres which remain inactive during long years preserve the integrity

roots, in particular, all of whose fibres have their nutritive centre in the intervertebral ganglia, it is well established that a certain number of these fibres only traverse the ganglion without contracting any relation with the bipolar cells.

of their structure, because they have not lost their connection with their nutritive cells.

We can conclude then from all this discussion, that in the cord as in the nerves, the nerve tubes are placed under the dependence of the nutritive elements. The direction in which the degeneration will be produced, as a result of a lesion of a column, will indicate to us at which extremity of the tubes the nutritive elements are situated. We are now in a condition to draw from the facts just studied some conclusions relative to the normal structure of the spinal cord.

ANATOMICAL DEDUCTIONS.

In the secondary degenerations which follow primary lesions of the brain, of the cord, and of the spinal roots, the extent, form, situation and course of these degenerations indicate in the most exact manner the normal distribution of the nerve fibres which have been destroyed at the point primarily injured; and permit us also to study very exactly the intimate structure of the white columns of the spinal cord, their origins and their terminations, where the scalpel and the microscope could only after great labor afford results less precise, often even very uncertain. L. Türek, first, sought to draw from the anatomo-pathological facts which he observed some deductions relative to normal anatomy; but he is rather anxious to deduce from it, by an interpretation which I do not think sufficiently strict, the direction of the physiological conductibility of different fasciculi of the cord. M. Gubler* also understood all the advantage that normal anatomy could derive from these facts, when he said in one of the conclusions of his memoir: "Thus the lines of softening in both directions

* *Du ramollissement cérébral atrophique*, (Arch. Gen. de Méd., 1859, t. 11, 6e conclusion.)

(ascending and descending) studied by attentive observers, will serve to determine the situation and the arrangement of the sensor and motor fibres in the columns as well as in the nervous centres. Here pathology will still afford light to anatomy and to physiology." Besides, this method is not new: it is only the application to the cord of a process employed by Waller in the study of the peripheral nerves, and which he himself designated under the name of a "new method for the anatomical investigation of the nervous system." It is by this method that we have been able to study the distribution and anastomosing filaments of the nerves. I think I may say that there would be every advantage in artificially producing secondary degenerations of the spinal cord, so as to make an experimental application of the Wallerian method to the cord.

We have already seen that lesions of different parts, and even of parts very high up in the brain, determine secondary degenerations which can be traced throughout the whole length of the spinal cord: these degenerations also exist exclusively in the antero-lateral columns. We may therefore conclude that there are tubes in the whole extent of these columns which have their nutritive cells in different parts of the brain. On the other hand, the descending degenerations diminish in intensity as they depart from the bulb; then the cerebral tubes which are prolonged into the cord have not all the same destination, but leave, in their course, the antero-lateral columns, so that only a very restricted number of them remain at the inferior portion of these columns. These fibres which abandon the antero-lateral columns do not escape by the roots; for in no case of secondary degeneration has an alteration of the spinal roots been noticed; we are then obliged to admit that they pass into and terminate in the gray substance.

The descending degenerations from lesions of the brain are not disseminated throughout the whole substance of the antero-lateral columns; they sometimes affect the internal portion of the anterior column on the same side as the primitive lesion, and this alteration of the anterior column disappears in the dorsal region; on the other hand, they always affect the posterior portion of the lateral column of the opposite side, and the degeneration continues as far as the inferior extremity of the cord. We conclude that the decussation of the pyramids is not complete; that some fibres, those of the external portion, which more rarely becomes degenerated, gain the internal portion of the anterior column, applying itself to the anterior sulcus, losing itself from point to point in the gray substance, and that the longest of these cerebral fibres do not go further than the middle of the dorsal region. This collection of fibres which the brain sends to the cord without decussation, and which is situated at the internal part of the anterior column, we will call the direct or internal cerebral fasciculus. As a second conclusion, we may state that the great majority of fibres which the brain sends to the cord decussate below the pyramids so as to become located at the posterior part of the lateral column of the opposite side; that they preserve this position throughout the whole of their descending course; that they insensibly become lost in the gray substance, but that some of them are sufficiently long to attain the inferior extremity of the rachidian axis. This collection of fibres which pass from the brain to the lateral column of the opposite side, we will call the decussating or external cerebral fasciculus.

We have now built up only a small part of the antero-lateral columns; the study of degenerations consecutive to primary lesions of the cord will enable us to complete

the description. We have stated that, when the cord is compressed at one point, the antero-lateral columns degenerate below the compressed portion, and that the alteration, though of but slight extent in the anterior columns, and in the anterior part of the lateral columns, is on the contrary very pronounced in the posterior and external portion of these latter fasciculi, and that in this situation it extends to the inferior extremity of the cord. Among the tubes which degenerate below the point compressed, there are some which come from the brain, and these are the ones of which we have spoken above. The direct cerebral fasciculi and the decussating cerebral fasciculi are in truth compressed at one point of their course, as is the remainder of the cord, and ought to degenerate in their inferior portion. It results from this, that at the internal part of the anterior columns, and at the posterior part of the lateral columns, the descending degeneration will implicate the fibres of encephalic origin. As it is only in this situation that there are any cerebral fibres, the degeneration of the remaining portion of the antero-lateral columns interests tubes of another class, tubes which do not come from the brain. The degeneration of these latter tubes follows a descending direction; they therefore have their nutrition cell above the point of compression. This nutritive centre is not in the brain, but it is above the point compressed; it is consequently in the gray substance of the cord above the point compressed.

There are, then, in the antero-lateral columns, independently of the fibres of encephalic origin, other descending fibres, medullary fibres proper, which arise from the gray substance of the cord itself. In order to understand the distribution of these latter fibres, we must recall, in an exact manner, the situation occupied in the cord by the fibres of encephalic origin. To render

the description less obscure, I think I should insist more particularly upon the form and position of the decussating cerebral fasciculus. The study of secondary degenerations, consecutive to primary lesions of the brain, has shown us that it is almost cylindrical, and located in the substance of the lateral column at its posterior part, in front of the line of insertion of the posterior roots, in the angle formed by the meninges and the external face of the posterior cornu. It does not come in contact with the pia mater, but is separated from it by other white fibres, in such a manner that, when it has been destroyed by secondary degeneration, the sections of the cord show at the posterior part of the lateral column a hole, as if cut with a punch, in the healthy medullary substance, a narrow band of which separates it from the meninges. In secondary degenerations from lesions of the cord itself, this hole is larger; it has increased in front and on the outside, has come in contact with the pia mater, and is thus transformed into a depression. This is because the degeneration implicates not only the fibres of encephalic origin, but also the medullary fibres proper. And as the depression which maps out the degeneration on sections of the cord, passes on towards the inferior extremity of the rachidian axis, gradually becoming narrower, we may conclude that certain medullary fibres descend, following the posterior part of the lateral columns, and become lost in the gray substance after going a long distance. We have already seen that these fibres have their superior extremity in the gray substance of the cord itself; they then establish relations between parts of the gray axis separated by quite long distances. We will designate these fibres by the name of long commissural fibres.

In compressions of the cord, the descending degener-

ation does not invade only the internal part of the anterior columns, and the posterior and external part of the lateral columns; the granular bodies are met with in the whole thickness of the antero-lateral column, but their number diminishes insensibly as we go further from the point compressed, and they disappear entirely at quite a short distance below the primary lesion. The fibres which thus degenerate through the whole substance of the antero-lateral columns, after a short descending course, are lost in the gray substance of the cord. They do not come from the brain, but they have their nutritive cell above the point of compression; they then arise from the gray substance of the cord, in which they also terminate at a short distance below their origin. I will denominate them the short commissural fibres.

Still this is not all: we have seen that in compressions which act upon the cord above the middle of the dorsal region a slight ascending degeneration of the posterior part of the lateral columns is observed; that this degeneration pursues its course in the restiform bodies, and even in the inferior peduncles of the cerebellum. We must therefore admit that this posterior part of the lateral columns, where we have already admitted the existence of two kinds of descending fibres, encephalic and medullary, contains also fibres of a third class, but in very small numbers: these should be fibres which have their nutritive cell at their inferior extremity. This nutritive cell we can only suppose to be in two points; either in the gray substance of the cord, or in the ganglia of the posterior roots. But we have seen that lesions of the posterior roots, which suppress the nutritive action of the ganglia for the cord, do not determine ascending degenerations of the lateral columns; we should then admit that the gray substance of the

cord sends along the posterior part of the lateral columns some fibres which reach the cerebellum by the restiform bodies and the inferior cerebellar peduncles. In several cases of secondary degenerations, a vain search has been made for the trace of tubes which should go from the restiform bodies, across the deep portion of the pons, in the direction of the optic thalami.

In conclusion, the antero-lateral columns enclose encephalic fibres disposed in two fasciculi, at each extremity, at the internal part of the anterior column and at the posterior part of the lateral column. Besides, they are for the most part formed by descending medullary fibres proper, which establish relations between the different levels of the gray substance, commissural fibres, quite short in the anterior columns and in the anterior part of the lateral columns, much longer in the posterior part of these same columns. Finally, there exists also in this posterior portion of the white anterior substance of the cord, some ascending fibres which establish relations between the rachidian axis and the cerebellum.

L. Türk, to whom belongs the discovery of ascending degenerations of the lateral columns, concluded from this that these columns contained in their posterior portion, fibres with a centrifugal and fibres with a centripetal current. It is possible that the lateral columns may conduct centripetal impressions: certain physiological facts, upon which I may not insist, would tend indeed to make us think so. However this may be, this opinion cannot be legitimately deduced from the examination of secondary degenerations. We can affirm only one thing, which is that some of the fibres of the lateral columns have their nutritive centres at their superior, and some at their inferior, extremity. But the degeneration of a tube is not necessarily produced in the direction of its physiological conductivity: thus

the sensor fibres of the peripheral nerves, the functional activity of which is exerted in the centripetal direction, have their nutritive elements at the superior extremity; so that the nutritive influence acts in an inverse direction to the physiological conductibility.

Let us now say a few words about the origin of the anterior roots, before passing to the study of the posterior columns. An experiment of Waller, already mentioned, proves that these roots have their nutritive centre in the cord. We have seen elsewhere that in compressions of the cord the anterior roots never degenerate either above or below the point primarily injured; from this we may conclude that they arise from the gray substance at a point very near their emergence, and that they run only a very short course along the antero-lateral column.

The constitution of the posterior columns seems to be less complex than that of the antero-lateral columns; but, in fact, their degenerations are not so completely known. From the special point of view which we take in this research, we can obtain our information from only two sources: from the study of compressions of the cord, and from that of the lesions of the roots.

Waller, in his experiments upon division of the posterior roots, had already remarked that, while the end attached to the ganglion remained healthy, the medullary end degenerated; and that "this disorganization could be traced for a short distance in the fibres of the posterior column of the cord, in the ascending direction."* Independently of these fibres, which are at once, or after a short course, lost in the gray substance, the posterior roots send others which pass through the columns for a much greater distance, and which are de-

* A. Waller, *Nouvelle méthode anatomique pour l'investigation du système nerveux*: Bonn, 1852. Appendix: 8e conclusion.

monstrated in the case of compression of the cauda equina, which we have borrowed from M. Cornil. In this case, there was an ascending degeneration of the whole length of the posterior columns, and the alteration, very pronounced in the lumbar enlargement, gradually diminished in intensity so as to terminate in a narrow band, spread out under the meninges at the superior portion of the posterior pyramids. There are then some fibres which pass from the posterior roots of the lower part of the cord along the posterior columns, and are lost from point to point in the gray substance, some of them terminating only at the floor of the fourth ventricle. These fibres represent only a small part of those which the posterior roots bring to the cord; the remainder pass at once into the gray substance without aiding in the formation of the posterior columns. This fact is plainly established by microscopic anatomy and by physiology, but could not have been deduced from the study of secondary degenerations.

The ascending radical fibres which we have just pointed out, do not by themselves alone constitute the posterior columns. In fact, in this case of ascending degeneration from compression of the posterior roots, a section of the cord made at the lumbar enlargement, at a point where it had not yet received any healthy posterior root, showed, upon the section of the posterior column, quite a large number of tubes, disseminated through the midst of the sclerosed mass, which had taken the place of the radical fibres. These new tubes did not come from the roots; they did not have their nutritive cell at their superior extremity, since we know that compressions of the cord do not determine a descending degeneration in the posterior columns: we must then admit that they had their origin in the gray substance of the inferior part of the cord.

The same may be said of other ascending fibres originating at different levels of the cord. We can demonstrate this proposition by comparing the form of the ascending degeneration in cases of compression of the roots, and in that of compression of the cord itself. When the degeneration is consecutive to a lesion of the roots, it is mapped out on the sections by a part of an ellipse, the convexity of the curve being in front; and, its two extremities resting on the posterior aspect of the cord, the tissue external to this line is perfectly healthy. When there is compression of the cord itself, these ascending radical fibres are injured at one point of their course and degenerate above the seat of compression; but the figure which the degeneration presents, upon sections of the cord, is no longer the same. In place of a segment of an ellipse, we have a triangle, the base of which is on the posterior face of the cord and the apex towards the commissure. This is because the degeneration also implicates other fibres which have their nutritive centre at their inferior extremity in the gray substance of the cord. These are the medullary fibres proper, like those which we have pointed out in the antero-lateral columns. In a case of compression of the cord above the lumbar enlargement, I have seen the degeneration pass on retaining its same triangular form as far as the superior extremity of the posterior pyramids; the medullary fibres proper of the posterior columns therefore terminate in the gray substance after an ascending course of variable length. Some of them extend from the lumbar enlargement as far as the floor of the fourth ventricle. They have their origin and their termination in the gray substance; they therefore deserve the name of the posterior commissural fibres.

Ascending radical fibres and posterior commissural fibres are intimately mingled in the posterior columns

without producing any confusion in their reciprocal distribution, since the form of the degeneration differs through the whole length of the cord, according as it implicates the former or the latter.

In the two cases of degeneration from compression of the roots or from lesion of the cord, the degenerated part, as it nears the bulb, becomes more and more limited to the posterior and internal portion of the posterior columns. We may therefore conclude that all the fibres of the posterior columns tend towards the posterior and internal portion of these columns, and are there located after they have run the greater part of their course. Then they probably curve forward and outward so as to terminate in the gray substance.

The distribution which I have just indicated is only exact for the fibres which come from the lower half of the cord. Of these fibres those which are prolonged as far as the superior part of the cervical region, are all situated in the substance of the small fasciculi and of the posterior pyramids. The fibres which originate in the upper half of the cord do not appear to mingle with the preceding, so that the sensor nerves of the lower limb and those of the upper limb should remain isolated from one another, separated by the intermediate posterior furrows. Indeed, in a case of compression of the cord at the upper part of the dorsal region, L. Türek has seen the degeneration occupy the external portion of the posterior columns. Unfortunately, he did not make sections through the substance of the bulb nor that of the pons, so that the anatomo-pathological demonstration of the continuation of a part of the posterior columns through the restiform bodies, is completely wanting.

To recapitulate, the posterior columns are formed from fibres which come directly from the posterior roots,

from commissural fibres, and probably also, at the upper part, from fibres which, following the lateral portions, reach the brain by the restiform bodies where they form relations with the ascending fibres of the lateral columns.

As a conclusion from all that precedes, we state, exclusively upon a basis of pathological anatomy, that we may consider the cord as essentially constituted by a gray axis, the different parts of which can doubtless communicate with each other even in the gray substance itself, but whose relations are also established through its whole length by commissural fibres, some anterior and others posterior. This gray axis should receive at its anterior part, and throughout its whole extent, fibres which come directly from the brain; it should receive at its posterior part and throughout its whole length, fibres which come from the ganglia of the posterior roots; these latter fibres being of two classes, some, direct, plunge immediately into the gray substance, the others ascending, only get there after a longer or shorter course. Then from the gray axis two classes of fibres should be given off; some should proceed towards the brain along the posterior part of the lateral columns, and perhaps also along the external part of the posterior columns; the others should leave the cord at a point very near their origin, and should go to the periphery along the anterior roots.

Thus considered, the cord may be represented as formed of intrinsic parts, the gray axis and the anterior and posterior commissural fibres, and extrinsic parts, some afferent and others efferent. The extrinsic afferent parts should have two origins, one encephalic and the other peripheral. The extrinsic afferent parts, of encephalic origin, should only exist in the antero-lateral columns, and should establish relations of each of these

columns with the two cerebral hemispheres; with the hemisphere of the same side by the direct or internal encephalic fasciculus, and with the hemisphere of the opposite side by the decussating or external encephalic fasciculus. The extrinsic afferent parts of peripheral origin should come from the spinal ganglia by the posterior roots, and should divide into two series of fibres, some plunging directly into the gray axis, the others also arriving at the gray substance after having assisted in the formation of the posterior columns. The extrinsic efferent parts should also have two destinations: some should pass up to the encephalic destination by the antero-lateral column, so as to reach the cerebellum; others, arising probably from the upper half of the gray axis, should reach the pons by the external part of the posterior columns. The others with a peripheral destination should emerge at once from the cord by the anterior roots so as to terminate in the muscles.

Thus the cord would form a necessary intermedial organ for all impressions which reach the brain from the periphery, and for all impulses which go to the periphery from the brain; no fibre would go directly from the brain to the muscles, or from the tegumentary surface to the brain.

This structure of the cord, based entirely upon pathological anatomy, is in perfect harmony with a large number of facts already established by the scalpel and by the microscope, and affords them complete confirmation; or rather, this harmony testifies in favor of the excellence of the method we have pursued.

The results at which we have arrived determine certain questions which were as yet doubtful; besides they seem to us to establish several new facts.

What we have said about the incomplete decussation of the pyramids has been known for a long time, and it

was known in what parts of the antero-lateral column the fibres, which come from the pyramids, were located; but the terminations of these fibres were not so precisely determined.

The commissural fibres of the antero-lateral columns had already been admitted by Todd and Schröder Vander Kolk; however we do not think that their distinction into two classes, according to their length and the special location of each of them, had been pointed out.

Notwithstanding the works of L. Türck, already published for some time, only very vague ideas were held about the ascending fibres of the lateral columns.

In conformity with the first opinion given by Schröder Vander Kolk, we have shown that certain fibres of the posterior roots assist a great deal in the formation of the posterior columns; but we think that M. Dean has exaggerated their importance in considering the posterior columns as exclusively formed by these roots. We have, in fact, proved that there are in these columns a large number of commissural fibres admitted by Todd, by Gratiolet, and by several other anatomists.

As regards the fibres which pass from the cord to the brain along the posterior columns, pathological anatomy has not yet given us sufficient information; however, we may say that, up to this day, other methods of investigation have not led to a greater degree of certainty: we are as yet reduced to physiological deductions.

SYMPTOMATOLOGY.

The clinical study of the secondary degenerations of the spinal cord has not yet been undertaken; and we may say that it was impossible to study them, when we only knew the first period of these alterations. When a nerve is destroyed at one point of its course, in such a manner as to suppress the relations of the centre with

the periphery, the function of this nerve is abolished, and if it still possesses some activity of its own, it cannot display it by any manifestation either of sensation or of movement. We understand, from this, that the substance of the injured elements may become disintegrated without there being any new symptom in the paralyzed parts. We may then state, *a priori*, that the work of degeneration which is going on in a column of the cord does not actually betray itself by any symptomatic modification. Clinical observation fully justifies this presumption. In fact, while the lateral column of the paralyzed side commences to show manifest signs of degeneration by the sixth day, following the commencement of the apopleptic attack, we do not see the symptoms present any notable changes at that period; the primary contraction which is very rare in cerebral softening, and uncommon in hemorrhage, is usually earlier, and is observed from the commencement of the symptoms, or during the first few days. In every case, this symptom, which may exceptionally appear at the period when the secondary degeneration is produced, finds its explanation in the cerebral lesions which we may, with good reason, consider as complications, and it should not be referred to the deuteropathic alteration of the spinal cord.

It is not the same for the contraction which comes on at a later period, a symptom almost necessarily consecutive to old cerebral lesions, and to which attention does not seem to us to have been sufficiently attracted. This contraction of the paralyzed parts which we almost invariably find in cases of hemiplegia of long duration, seems to us to have been wrongly referred to a chronic irritation of the brain, due to a contraction of the cicatrice of the primary seat of disease, or to the progressive march of an imaginary encephalitis. The cause of this

permanent, tardy contraction seems to us to be in the cord. Certainly we cannot refer it to the granulo-fatty alteration of the tubes, an alteration which, as we have said above, cannot reveal itself by any symptom; besides, at the time when this contraction commences, the tubes injured in the brain are already destroyed throughout their whole extent. But the tubes of encephalic origin are mingled in the cord with other tubes which arise from the gray substance of the cord itself. These medullary tubes proper are then plunged into the midst of a tissue which, after a considerable period from the commencement of apopleptic symptoms, is the seat of quite an abundant proliferation of connective tissue. It is to the irritation of the medullary tubes by this neoplastic formation, it is to this secondary sclerosis, that we think we should refer the later contraction in cases of hemiplegia.

If this hypothesis is correct, we should meet with analogous symptoms in all those diseases, whatever be their nature and their location, which are accompanied by descending degeneration, with secondary production of connective tissue in the lateral columns; and these symptoms should closely resemble those produced by primary sclerosis of these columns. We are thus led to seek what are, in these different pathological conditions, the common symptoms which can be referred to this common cause, primary or secondary sclerosis of the lateral columns.

It is principally in the modifications which supervene on the part of the motor apparatus that we shall find these symptoms common to the different diseases which are accompanied by secondary degeneration of the spinal cord. We must understand that these researches are not free from difficulties, not only on account of the complication of facts, which hinders their interpretation,

but especially because much obscurity still reigns upon this point of the symptomatology of paralyses.

Of all the modifications which the condition of the muscles may present in cases of hemiplegia, the contraction is without contradiction the most important; it is also the one which has principally attracted the attention of observers. Early or tardy, temporary or permanent, it has always been regarded as an index of an irritation going on in the nervous centres. In accordance with Lallemand and MM. Cruveilhier, Bouilland, Andral, Durand, Fardel, Todd has especially insisted upon the semiological importance of this symptom, and has made it the basis of a division of cases of hemiplegia. He admits three classes of them, according to the conditions of the muscles. In the first, the paralyzed limbs remain flaccid and relaxed; in the second there is early rigidity of these muscles, and the rigidity makes its appearance at the very moment of the apoplectic attack, or a short time after. Finally, in the third category, the majority of hemiplegic cases enter, in which the paralyzed muscles, flaccid at the commencement, are attacked at a later period, and progressively, by a rigidity which becomes permanent.

This distinction which Todd has established and so strongly insisted upon, between the early rigidity and the tardy contraction is no less important in a pathogenetic than in a clinical point of view. "If the paralysis had been accompanied by rigidity," says the English author,* I should have been led to the conclusion that the cerebral lesion was of an irritating nature. This rigid state of the paralyzed limb (when it comes on at the same time as, or very soon after, the

* Clinical lectures on paralysis, certain diseases of the brain, and other affections of the nervous system, by Robert Bentley Todd: see. v. p. 100; London, 1856.

paralysis) is generally seen when some superficial part is affected, as the meninges or the surface of the brain, or when there is a growth from the skull, or a tumor in the hemispheres, or in some cases of inflammatory softening, or in some conditions keeping up a constant irritation; but when there is a simple rupture of the fibres of a deep-seated part of the brain, as the corpus striatum, with or without pressure, there is no irritation, and the paralyzed muscles are quite lax." And in another place:—"In the majority of cases the early rigidity is due to an apoplectic clot. My idea as to its cause is, that it depends upon a state of irritation, propagated from the torn brain to the point of implantation of the nerves of the affected muscles. But, you will ask, why is it that in some cases of clot, the hemiplegia will be accompanied with complete relaxation of muscles, while in other cases the rigidity of which I have spoken exists? The answer to this question is as follows: In the cases where there is no rigidity, the clot lies in the midst of softened brain, and has not in any degree encroached upon sound brain; but when rigidity exists, the clot has extended beyond the bounds of the white softening, and has torn up, to a greater or less extent, sound brain. * * * This form of hemiplegia sometimes occurs in surgical practice, in consequence of a blow on the head, with depression of bone, or from considerable hemorrhage within the cranium, such as results from injury of the middle meningeal artery, or one or more of its branches. The paralysis of the opposite side is then accompanied by rigidity.

* * * Sometimes inflammation of the pia mater, or arachnoid, causes an accumulation of fluid in the sub-arachnoid spaces, and then there is paralysis and rigidity. * * * An affection of the

* R. B. Todd Lectures, 10 and 11 *passim.*

brain, of an irritating character, may give rise to this form of hemiplegia." All these assertions of Todd are based upon observations where autopsies were made; it is with justice that he states the encephalic seat and the irritating nature of the cause of early contractions in certain hemiplegias. Besides, this opinion does not materially differ from that of French pathologists. For a long time we have considered contractions in hemiplegia as a sign of encephalitis; and, besides this too absolute belief, a certain number of facts, several of which have been long known, have led us to admit that the hemorrhage determines immediate contractions, when the seat of disease, breaking up the convolutions, reaches the meninges, or when it bursts into the cavity of the ventricles. Then, is it not to an inflammation which is developed about the seat of disease, that we should refer the muscular rigidity which comes on a few days after the apoplectic attack?

According to this opinion, which nothing now seems to contradict, the muscular rigidity would result either from the irritation of the peripheral end of the fibres lacerated by the traumatic cause, or by the hemorrhage, or by the softening, or else from the irritation of the fibres which surround the primary seat of disease, and which have preserved their integrity. According to the first hypothesis, as the lacerated fibres are destroyed after the sixth day, they should rapidly cease to be the seat of any phenomena of excitation. It would then be to these temporary contractions of the commencement that we could apply the opinion of M. Gubler* concerning

* *Du Ramollissement cérébral atrophique (Archesis gén. de méd., 1859.)* M. Gubler thus expresses the seventh conclusion of his Memoir: Clinical observation has as yet taught us nothing of the particular symptoms of secondary atrophic softenings; but we can foresee that after them we will observe a cessation of the phenomena

ing the part of atrophic softening in the cessation of phenomena of excitation, and in particular of rigidity.

If we may, strictly, consider secondary degenerations as capable of putting an end to the muscular rigidity of the commencement, they play an entirely different part with reference to the later contractions; not, I repeat, that we can consider the contraction as the symptomatic expression of the work of granulo-fatty destruction of the tubes of the cord, nor even that we can attribute to the granules resulting from this destruction the power of irritating the neighboring tubes. The muscles remain flaccid and inert while this process of atrophy is going on; they only become rigid at a later period, when the hypergenesis of nucleated elements commences to appear in the degenerated column.

The later contractions of paralyzed muscles in cases of hemiplegia, are surely those whose clinical history is most imperfect; not that they have escaped notice, but their varieties, the date of their commencement, and the deformities (often characteristic) which they produce, have as yet been only very incompletely pointed out. These contractions are, however, very frequent, and we may say that they are the rule in cases of hemiplegia of long duration. Out of thirty-two cases, the analyses of which will be given further on, I only once found the flaccid hemiplegia. I do not propose to trace out a complete study of these contractions: I will only endeavor to point out the most marked features of their history, taking as a basis the numerous facts which the clinique of the Salpêtrière can furnish.

When we examine a patient suffering from an old

of excitation, such as contraction, provided that the long duration of the primary affection has not given rise to such changes in the condition of the muscles as are opposed to the mobility of the parts.

hemiplegia, we usually see the forearm of the paralyzed side is semi-flexed upon the arm, and we are assured that this position is invariably maintained against the influence of gravity by the tension of the muscles of the anterior part of the arm. The biceps in particular, even in cases of very long duration where it has undergone a notable atrophy, makes a more or less marked prominence, and it is evident to the touch that it is stretched like a cord between its insertions. If we tell the patient to extend the arm, he succeeds with great difficulty, even in those cases where voluntary motion is not entirely lost, in increasing by a few degrees the angle formed by the arm and the forearm, and then he is usually obliged to perform this movement mechanically, by pulling upon the paralyzed hand with the member of the healthy side. If the observer himself tries to produce this movement of extension at the elbow joint, he finds a variable resistance, which in some cases cannot be overcome. Usually, however, he succeeds in extending the forearm, at least within certain limits, and he experiences during this movement the same sensations as when the limbs of a dead body in the state of rigidity are made to move. The old cases of hemiplegia, in which the articulations of the paralyzed arm are movable and loose, like those of a corpse when the rigidity has been overcome, are entirely exceptional. It is to these latter that we give the name of flaccid hemiplegias. We will regard all others as rigid, whatever may be the degree of resistance produced by the muscles, and whatever may be the number of muscles affected.

In hemiplegias of long duration, it is very rare to find all the muscles of one half the body paralyzed; it is equally rare to find voluntary motion injured to the same degree in all the affected muscles; it is also ex-

ing the part of atrophic softening in the cessation of phenomena of excitation, and in particular of rigidity.

If we may, strictly, consider secondary degenerations as capable of putting an end to the muscular rigidity of the commencement, they play an entirely different part with reference to the later contractions; not, I repeat, that we can consider the contraction as the symptomatic expression of the work of granulo-fatty destruction of the tubes of the cord, nor even that we can attribute to the granules resulting from this destruction the power of irritating the neighboring tubes. The muscles remain flaccid and inert while this process of atrophy is going on; they only become rigid at a later period, when the hypergenesis of nucleated elements commences to appear in the degenerated column.

The later contractions of paralyzed muscles in cases of hemiplegia, are surely those whose clinical history is most imperfect; not that they have escaped notice, but their varieties, the date of their commencement, and the deformities (often characteristic) which they produce, have as yet been only very incompletely pointed out. These contractions are, however, very frequent, and we may say that they are the rule in cases of hemiplegia of long duration. Out of thirty-two cases, the analyses of which will be given further on, I only once found the flaccid hemiplegia. I do not propose to trace out a complete study of these contractions: I will only endeavor to point out the most marked features of their history, taking as a basis the numerous facts which the clinique of the Salpêtrière can furnish.

When we examine a patient suffering from an old

of excitation, such as contraction, provided that the long duration of the primary affection has not given rise to such changes in the condition of the muscles as are opposed to the mobility of the parts.

hemiplegia, we usually see the forearm of the paralyzed side is semi-flexed upon the arm, and we are assured that this position is invariably maintained against the influence of gravity by the tension of the muscles of the anterior part of the arm. The biceps in particular, even in cases of very long duration where it has undergone a notable atrophy, makes a more or less marked prominence, and it is evident to the touch that it is stretched like a cord between its insertions. If we tell the patient to extend the arm, he succeeds with great difficulty, even in those cases where voluntary motion is not entirely lost, in increasing by a few degrees the angle formed by the arm and the forearm, and then he is usually obliged to perform this movement mechanically, by pulling upon the paralyzed hand with the member of the healthy side. If the observer himself tries to produce this movement of extension at the elbow joint, he finds a variable resistance, which in some cases cannot be overcome. Usually, however, he succeeds in extending the forearm, at least within certain limits, and he experiences during this movement the same sensations as when the limbs of a dead body in the state of rigidity are made to move. The old cases of hemiplegia, in which the articulations of the paralyzed arm are movable and loose, like those of a corpse when the rigidity has been overcome, are entirely exceptional. It is to these latter that we give the name of flaccid hemiplegias. We will regard all others as rigid, whatever may be the degree of resistance produced by the muscles, and whatever may be the number of muscles affected.

In hemiplegias of long duration, it is very rare to find all the muscles of one half the body paralyzed; it is equally rare to find voluntary motion injured to the same degree in all the affected muscles; it is also ex-

ceptional to find all the paralyzed muscles rigid. The contraction in cases of hemiplegia is never general; but it does not affect indifferently such and such a muscle, or such and such a group of muscles; on the contrary it presents a certain regularity in its determination.

I do not know that it has ever been observed in the muscles of the trunk, and it may be said to be limited to the muscles of the extremities. However, there is perhaps an exception to be made for the muscles of the face. Certain facts have led me to think that the muscles of the face, paralyzed at the time of the apoplectic attack, may afterwards undergo retraction, and produce a deviation of the features of the side of the face opposite to that where the deviation primarily existed. There are the cases in which the observations made at the commencement of the affection indicated a facial paralysis on the same side as the hemiplegia, with deviation of the features of the healthy side, and where, upon examining the patients some years later, I found that the features were, on the contrary, retracted on the same side as the paralysis, thus simulating an alternate paralysis.* As for the muscles of the orbit and neck, the contraction of which so often turns the face and the eyes toward the side of the diseased hemisphere at the moment of the attack, we do not see that they are ever affected with a permanent contraction at a later period.†

* See Bouchard, *Aphasic sans lésion de la troisième circonvolution frontale gauche, dans comptes-rendus de la Société de biologie*, p. 111, année 1864. In this observation, there was no lesion of the pons capable of explaining the alternate hemiplegia, but there was a very pronounced secondary degeneration.

† M. Vulpian has insisted upon this symptom, which M. Cruveilhier had already noticed, and M. Prevost has made it the subject of an interesting memoir: *De la Déviation conjuguée de la face et des yeux dans les hémiplégies.* (Gazette hebdom., 1865.)

Thus limited to the extremities, the muscular rigidity is not observed in the same degree in the superior and in the inferior.

It is always less marked and more limited in the pelvic than in the thoracic extremities; it may be absent in the former, while it exists to a more or less marked extent in the latter, while the reverse is not true.

Out of 31 cases of hemiplegia with rigidity, the contraction affected the muscles of the upper extremity 31 times, and the muscles of the lower extremity only 14 times. Even in the thoracic extremity, the rigidity is not always observed in all the muscles; and those which are rigid are not always so to the same extent. Thus we rarely see the shoulder elevated—10 times in 31 cases—and when it droops, which is more common—15 times in 31 cases—this result is due rather to the force of gravity than to muscular traction. We do not usually find any great difficulty in giving to the arm those different movements which the articulation of the shoulder permits; but, abduction is often quite limited. In its habitual attitude, the arm of hemiplegics is nearly always in a state of adduction, which the action of gravity is often sufficient to explain. Rarely, indeed, the arm is so strongly pressed against the thorax that it may be necessary to attribute it to the contraction of the pectoralis magnus; however, this latter cause, though very evident in some cases, should usually be associated to a certain extent with the action of gravity; for, besides abduction being impeded, the humerus is frequently—18 times out of 31—in a more or less pronounced state of rotation inward.*

While the muscles of the regions of which I have just

* We shall see that, out of 31 cases of rigid hemiplegia, I have 12 times seen the arm in adduction, once in abduction, and 19 times in an indifferent position.

mentioned are contracted in only a slight degree, or even not at all, the muscles of the arm, of the forearm and of the hand, are always completely or partially contracted, and, in every case, it is in those parts that the tardy rigidity is the most pronounced.

The contracted muscles, triumphing over those which are only paralyzed, produce special and permanent attitudes of the limbs; but those remarkable deformities which we find in old cases of hemiplegia, result not only from the predominant action of the paralyzed and contracted muscles over those which are attacked by flaccid paralysis; more frequently, indeed, the deformities are the result of the contraction of antagonistic groups of muscles. This is easily demonstrated for the muscles of the arm and forearm.

The joints which the contraction has placed in a fixed position communicate to the observer a notable resistance, whatever be the direction in which he tries to move them. The elbow, for example, which is usually semi-flexed in cases of hemiplegia, is sometimes as difficult to put in a condition of complete flexion as in that of extension.

Often, however, the forearm presents in both directions a very limited degree of mobility, compatible with some very restricted voluntary or communicated movements; but if we try to increase the movement, we suddenly experience the resistance which I have mentioned above. These movements which we endeavor to produce are alike painful in flexion and extension. Finally we can determine by the touch that the antagonistic muscles are equally contracted. While the biceps is stretched like a cord, we feel the triceps hard and rigid.

We might suppose that this contraction of antagonistic groups of muscles was only a spasm, a reflex con-

vulsion provoked by the pain induced by the motions which we give to the paralyzed limbs, something similar to the muscular retractions in arthritis or arthralgia. But in these cases the inhalation of chloroform suddenly puts an end to the spasm and restores their entire freedom of motion to the joints; while I have convinced myself, with M. Charcot, that this is not the case with rigid hemiplegias. Several patients having been put under the influence of chloroform, we have seen that while all the other muscles became relaxed, the contracted muscles preserved a marked rigidity, to a less degree, however, than when the patients were not under anaesthetic influence, but sufficient to prevent complete extension or flexion, and to reduce to their primary position the limbs whose attitudes had been modified. If we continued the action of chloroform for a longer time, we then saw one of the antagonistic groups yield a little to the more powerful traction of the opposing muscles, and produce a slight change in the position of the articulation; then this change once produced remained, even after the patient came out from under the influence of the anaesthetic, and the limb gradually returned to its former position, but not until several hours after the cessation of the inhalations.

The permanent vicious attitudes in hemiplegias of long duration are then for the most part the result of the opposing action of antagonistic groups of muscles contracted in a relatively greater or less degree. Hence it is that the position of the limb is generally intermediate between those which would be produced by the isolated action of these groups of muscles, more or less flexed or more or less extended, according as the contraction is stronger in the flexors or extensors. This fact is made evident by a symptom which we can produce at will in certain hemiplegies, and particularly in

those having a unilateral atrophy of the brain resulting from an affection of that organ, dating back from infancy. The usual attitude of these patients consists in a flexion of the forearm with pronation and flexion of the hand and fingers. If by force we extend the fingers, we see that at a certain point they come spontaneously and suddenly as the movement of a spring into a condition of forced extension, at the same time that the flexion increases in the radio-carpal articulation, and the limb remains in this new posture for an indefinite period. If we then induce flexion, we at first experience a certain amount of resistance, then suddenly again the flexion of the fingers is spontaneously completed, and the hand is slightly straightened; thus the primitive attitude is reproduced. Out of 14 patients in the service of M. Delasiauve, suffering from cerebral atrophy, I have observed this symptom twice, and I have found it once with M. Charcot in one of his patients who had cerebral softening dating back thirteen years.

The vicious attitudes produced by permanent contraction in hemiplegics are very variable; they are principally remarkable in the upper extremity. If we consult the table in which are noted the 31 cases of rigid hemiplegia upon which this description is based, we see, as I have said above, that the shoulder is elevated 15 times, lowered 10 times, in an indifferent position 6 times; that the arm is adducted 12 times, abducted once, in an indifferent position 18 times; that it is rotated inward 18 times, and that 13 times it does not show any tendency to rotation in either direction. We see, besides, that the elbow is flexed 27 times, extended 3 times, in an indifferent position once; that the forearm is pronated 24 times, supinated 7 times; that the hand is flexed 16 times, extended 15 times, in an indifferent position 10 times; finally that the fingers are flexed 28 times, extended 3 times.

The hand being always in a determined position of pronation or of supination, and the fingers being always either permanently flexed or extended, we may arrive at the following conclusion: that of all the muscles of the economy, those of the forearm are most often generally affected with permanent contraction in cases of hemiplegia; hence the precept that we should examine, in cases of softening or hemorrhage of the brain, dating back for some time, whether the movements of rotation which we give to the radius are equally easy in both directions, and whether the fingers can be completely straightened or flexed without difficulty.

Many of these partial attitudes which I have just pointed out are habitually grouped together and produce deformities of the whole region, the various elements of which do not appear related to one another according to invariable rules, but in which it is nevertheless possible, amid very numerous exceptions, to recognize certain general types. In order to characterize these types, we should take as a starting point the partial deformities, which are never absent, that is to say the condition of pronation or supination of the forearm, and the state of flexion or extension of the fingers. We may thus artificially create four varieties, which, according to our observations, are distributed in the following manner: out of 31 cases of rigid hemiplegia, we find 22 times pronation with flexion of the fingers, twice pronation with extension of the fingers, 6 times supination with flexion of the fingers, once supination with extension of the fingers. Adding now the condition of extension or of flexion of the articulation of the elbow, we should double the number of these varieties, but clinically we have only been able to find the six following varieties:

Flexion of the elbow, pronation and flexion of the fingers, 18 times.		
" " " pronation and exten. of the fingers, 2	"	"
" " " supination and flexion of the fingers, 6	"	"
" " " supination and exten. of the fingers, 1	"	"
Extension of the elbow, pronation and exten. of the fingers, 3	"	"
Indifferent position of the elbow, pronation and flexion of the fingers,	1	"

An examination of this table shows that there is no need of thus multiplying the varieties, and that for the clinique we should recognize one great type, the type of flexion characterized by the simultaneous flexion of the elbow and the fingers, or, in the absence of rigidity in the elbow joint, by the simple flexion of the fingers. We will also place in this type of flexion, the cases in which the fingers being extended the flexion of the elbow is so pronounced, that the angle formed by the arm and the forearm is less than 135 degrees.

Another type much less frequent will be characterized by the complete extension of the elbow, whatever be the condition of the fingers, or by the extension of the fingers, provided that the angle of flexion of the elbow be more than 135 degrees.

By consulting the table in which the angles of flexion of the elbow are indicated, we will see that the type of flexion is observed 26 times, while we only meet with the type of extension 5 times.

The condition of pronation or of supination of the forearm adds two varieties for each of these types: thus clinically, we may admit four forms of deviation of the upper extremity in hemiplegias with tardy contraction, and these forms are observed in the following order of frequency:

Flexion with pronation,.....	20 times.
" " " supination,.....	6 "
Extension with pronation,.....	4 "
" " " supination,.....	1 "

We will describe only the first form, which is by far the most frequent. In this form we have seen the shoulder lowered 9 times and elevated 7 times; in four cases only, was the shoulder of the diseased side on the same horizontal line as the other. The arm is usually drawn to the body, either by its weight, or by a slight contraction of the *pectoralis magnus*; it is in this form that we have met the only case of abduction of the arm which we have observed. In the 20 cases in which there was flexion and pronation, we have 11 times seen the hand flexed with the fingers; once the hand flexed while the fingers were extended; once the hand extended while the fingers were flexed; finally, the fingers were flexed 7 times while the hand was in an indifferent position. In the case where the flexion of the elbow was most pronounced, the angle formed by the forearm with the arm was 30 degrees.

In this form of flexion with pronation which we usually meet in hemiplegies, the arm is drawn toward the trunk, and, owing to the rotation of the humerus, the forearm is applied against the body; the hand, usually flexed as well as the fingers, is, according to the degree of flexion of the elbow, pressed against the abdomen or against the thorax, and the parts in contact vary according to the degree of pronation of the forearm. In a first degree, the hand is in contact with the trunk by its palmar surface; in the second degree, by its radial edge; in the third, by its dorsal aspect; in the latter case, the elbow is more or less carried forward.

In the type of extension, we can still find these three degrees of pronation. The third was not shown by any of the patients referred to in the table, but it was very marked in the case of a woman in the service of M. Charcot, who has recently died from an old softening.

In this woman, the left forearm was completely extended, the hand flexed at a right angle, and the fingers firmly folded up in the palm. The movement of rotation had carried the hand directly outward, the ulnar edge was in front, the radial behind, and this deformity had been increased by a rotation of the arm which had brought the olecranon directly in front. In the case of this woman, whose medulla oblongata I have shown to the Anatomical Society, the descending degeneration had advanced to an extent which we rarely find: the secondary sclerosis of the cord was visible as far as the inferior extremity of the left lateral column, and I should add that the sclerosis reached the meninges towards the middle of the dorsal region, instead of forming a little band, completely surrounded by healthy white substance. I was then too absolute in stating in a former part of this work, that no fibre of the decussating encephalic fasciculus came in contact with the pia mater. In this woman, besides, the flexion of the fingers was such, that the nails in growing cut the skin of the palmer surface. This occurrence, which is not very rare, and which has already been noticed by Todd,* produces very painful ulcerations which secrete an infectious discharge; great care should therefore be taken of the hands and nails; it is prevented by permanently placing in the palm of the hand a roll of bandage, which is sufficiently held there by the contraction of the fingers.

I should say in conclusion of what has reference to the deformities of the hand, that when the hemiplegia commences, before the complete development of the individual, and above all in infancy, the hand which is usually flexed, instead of showing the flexed joints by sharp angles, presents on the contrary upon its dorsal

* Loc. cit., lecture x.

portion a regularly convex surface which continues without interruption from the forearm to the last phalanges. This peculiar form is doubtless the result of an atrophy of the osseous tissue and of the articular prominences; an atrophy in which the subcutaneous cellular tissue does not participate. This character is sometimes sufficient, in the absence of any history, to distinguish a former softening in the adult from unilateral cerebral atrophy consecutive to some lesion which has destroyed a more or less considerable portion of one hemisphere during infancy.*

I shall pass more rapidly over the tardy contraction of the lower extremity in hemiplegies, and the deformities which are its consequences. I shall only state that out of 32 cases of hemiplegia of long duration I have found muscular rigidity in the pelvic extremity only 14 times; the hip was rigid 10 times, 4 times flexed, 6 times extended. The flexion was 3 times accompanied by abduction; the extension was 4 times accompanied by abduction. The knee was found flexed 10 times; 22 times the limb was in the axis of the thigh without any appreciable rigidity. These 10 cases of flexion of the knee coincided 5 times with extension of the hip, 4 times with flexion and once with relaxation of the coxo-femoral articulation. The foot was found rigid and out of its proper position 11 times, 9 times presenting the type of talipes equinus and twice that of talipes talus. Of the 9 cases of talipes equinus, 5 were accompanied by flexion of the knee. The 2 talipes talus coincided with a considerable degree of flexion in the femorotibial articulation.

* Consult upon this subject a memoir presented by M. Cotard to the Society of Biology in 1865: Note sur quelques cas d'atrophie cérébrale; de l'attitude des membres paralysés dans cette affection.

In this woman, the left forearm was completely extended, the hand flexed at a right angle, and the fingers firmly folded up in the palm. The movement of rotation had carried the hand directly outward, the ulnar edge was in front, the radial behind, and this deformity had been increased by a rotation of the arm which had brought the olecranon directly in front. In the case of this woman, whose medulla oblongata I have shown to the Anatomical Society, the descending degeneration had advanced to an extent which we rarely find: the secondary sclerosis of the cord was visible as far as the inferior extremity of the left lateral column, and I should add that the sclerosis reached the meninges towards the middle of the dorsal region, instead of forming a little band, completely surrounded by healthy white substance. I was then too absolute in stating in a former part of this work, that no fibre of the decussating encephalic fasciculus came in contact with the pia mater. In this woman, besides, the flexion of the fingers was such, that the nails in growing cut the skin of the palmer surface. This occurrence, which is not very rare, and which has already been noticed by Todd,* produces very painful ulcerations which secrete an infectious discharge; great care should therefore be taken of the hands and nails; it is prevented by permanently placing in the palm of the hand a roll of bandage, which is sufficiently held there by the contraction of the fingers.

I should say in conclusion of what has reference to the deformities of the hand, that when the hemiplegia commences, before the complete development of the individual, and above all in infancy, the hand which is usually flexed, instead of showing the flexed joints by sharp angles, presents on the contrary upon its dorsal

* Loc. cit., lecture x.

portion a regularly convex surface which continues without interruption from the forearm to the last phalanges. This peculiar form is doubtless the result of an atrophy of the osseous tissue and of the articular prominences; an atrophy in which the subcutaneous cellular tissue does not participate. This character is sometimes sufficient, in the absence of any history, to distinguish a former softening in the adult from unilateral cerebral atrophy consecutive to some lesion which has destroyed a more or less considerable portion of one hemisphere during infancy.*

I shall pass more rapidly over the tardy contraction of the lower extremity in hemiplegies, and the deformities which are its consequences. I shall only state that out of 32 cases of hemiplegia of long duration I have found muscular rigidity in the pelvic extremity only 14 times; the hip was rigid 10 times, 4 times flexed, 6 times extended. The flexion was 3 times accompanied by abduction; the extension was 4 times accompanied by abduction. The knee was found flexed 10 times; 22 times the limb was in the axis of the thigh without any appreciable rigidity. These 10 cases of flexion of the knee coincided 5 times with extension of the hip, 4 times with flexion and once with relaxation of the coxo-femoral articulation. The foot was found rigid and out of its proper position 11 times, 9 times presenting the type of talipes equinus and twice that of talipes talus. Of the 9 cases of talipes equinus, 5 were accompanied by flexion of the knee. The 2 talipes talus coincided with a considerable degree of flexion in the femoro-tibial articulation.

* Consult upon this subject a memoir presented by M. Cotard to the Society of Biology in 1865: Note sur quelques cas d'atrophie cérébrale; de l'attitude des membres paralysés dans cette affection.

At what period and in what manner is this tardy contraction developed in hemiplegies?

This is a question which has scarcely been proposed, and which is far from having been decided. Todd, who has distinguished so carefully between the precocious and the tardy rigidity, says that he has met with the latter one year after the apoplectic attack, and he quotes from M. Andral a case where the contraction came on three months after the commencement of the hemiplegia. We may see that in one patient, whose case is referred to in the table, the flexor muscles of the fingers were rigid at the end of four months, but in her case the rigidity had already existed for some time. We have had an opportunity, in the case of this woman, to follow the development of the disease from its commencement, and her case is interesting in more than one respect. She was suddenly attacked at the age of 66 years, with apoplexy with complete loss of consciousness and left hemiplegia, without having presented any prodromic symptoms. The following day the intelligence had entirely returned, the paralyzed muscles were flaccid and there was no fever. The temperature of the rectum varied from morning to evening between 100° and 98.9°. At the end of eight days the fever came on; the temperature went up to 101.1°; there was excitement with delirium, and the paralyzed muscles became rigid. Two days after, the temperature came down to 99.6°; the intelligence was restored and the muscles had become flaccid again. From this time the general symptoms disappeared, but the paralysis remained. Three weeks after the commencement of the illness the fingers were semi-flexed, but could be easily extended: however, forcible extension appeared a little painful. Two months after the attack the flexion of the fingers was more pronounced, and quite a marked resist-

ance was experienced when we tried to extend them, an operation which seemed to produce considerable pain; the forearm was slightly pronated, and resisted slightly any movements of supination which we communicated to it; it presented a very slight amount of flexion; we were able to increase this flexion without hurting the patient, but when we afterwards extended it, we observed that after having easily reduced it to its former position we experienced a sudden resistance, of such a kind that the extension could only be completed by an effort which was painful to the patient. At this time there were no cerebral symptoms and no fever.

In this case we see a precocious contraction connected, as the delirium and fever indicate, with slight symptoms of secondary encephalitis; then we see a contraction become insensibly developed, traces of which we can barely find at the end of three weeks, and which is no longer doubtful at the end of three months. It is this latter contraction, which has since increased while the cerebral functions have returned more and more to their normal condition, that we think should be referred to the sclerosis secondarily developed in the place of the degenerated fibres of the lateral column.

This case also shows that if the muscles of the forearm are the ones usually affected by tardy contraction, it commences likewise in them. This contraction comes on gradually and insensibly; this is the reason why we can hardly ever obtain from the patients information of any value concerning the time of the appearance of this symptom. They know that at first their limb did not offer any resistance to the movements communicated to it, and that at a later period it was fixed in one permanent attitude which could only be altered by a certain degree of force, but the transition between these two conditions has been so gradual that usually

it is impossible for them to tell, even approximatively, the time of the commencement of the contraction. The determination of this time is almost as difficult for the physician who is watching the development of the disease; so that he had better not give the result of his observations except after quite long intervals, the changes undergone by the muscles from day to day being entirely inappreciable. In the preceding case, the contraction was evident at the end of two months, but it already existed before this time, and I may state that, having inquired into this question of a certain number of patients, I think I may conclude from their replies that while the limb was flaccid during the first month, it already presented a vicious attitude during the third month. It would then appear that the permanent contraction habitually commences in the course of the second month. It is plain that new investigations are necessary to determine this point, as yet obscure, in the symptomatology of hemiplegias.

The contraction commences in the muscles of the forearm; generally the fingers are flexed and the forearm is pronated; then, in most cases, the elbow becomes flexed, and, while the fingers curve more and more, the flexion of the elbow progressively increases in such a manner, that for a long time the attitude of the limb is changed, showing it more every day.

I have remarked that in the patient of whom I have just spoken the straightening of the contracted parts was painful from the commencement, even when a slight effort sufficed to overcome the resistance of the muscles, and then these explorations resulted in momentarily increasing the rigidity. On the contrary, when the contraction is final, the muscles which we extend by force oppose during a considerable time the movements which we communicate to the limbs.

Sometimes, upon lifting the contracted arm of a hemiplegic by the end of the fingers, we see the entire limb agitated by a rapid trembling similar to that which we produce by the same proceeding in the inferior extremities of patients suffering from compression of the cord. I have only met with this symptom in the thoracic extremity in hemiplegia, and I think that we may consider it as an exception.

When the contraction has reached its complete development, it may notwithstanding present momentary variations in its intensity under the influence of certain circumstances, such as emotions or pains along the course of the nerves of the limb; in young women having hemiplegia, we sometimes see the contraction increase during the menstrual period.

I have already spoken of the action of chloroform upon contracted muscles; I shall also say some words of electricity. The induced currents which usually produce in the flaccid muscles of hemiplegias of short duration, slighter contractions than in the normal condition, produce on the contrary a marked and sometimes an exaggerated effect upon the muscles affected with permanent rigidity, even when they have undergone a certain amount of atrophy. But when this atrophy affects unequally the different muscles of a limb, we can see, as I have found in one case, that by applying the poles to the muscles which act against the deviation, this deviation, far from diminishing, on the contrary increases. In this case, no doubt, the currents traverse the atrophied muscles and influence their antagonists so as to increase their already predominant power.

Once established, the tardy contraction may last for long years, often during the whole life of the individual, but sometimes it seems to diminish. Then however, the

muscles cannot undergo a sufficient amount of extension, and the articulations present certain alterations which hinder any complete straightening, and the vicious attitudes remain; they are then passive. One might also ask whether we can hope for a cure of the hemiplegia when the muscles are already affected by tardy contraction. I do not know any fact which can encourage this hope, and the patients sometimes are deluded with reference to this subject.

Voluntary motion is not always totally abolished in the paralyzed limbs of hemiplegics, but the contraction limits and renders more difficult the muscular actions which are still under the influence of the will. If the rigidity diminishes, then these movements recover more liberty, and such a patient who is always to remain impotent imagines that he sees in this modification the commencement of his cure.

Some symptoms which have a very great analogy to these which we have just studied are observed in certain diseases of the cord which are accompanied by secondary sclerosis of the lateral columns, and especially in cases of compression of that organ. During the first period which correspond to the granulo-fatty degeneration of the tubes, the paralyzed muscles remain flaccid; then, at a more or less advanced period, the contraction appears, the muscles atrophy and the lower limbs assume permanent attitudes which it is difficult to overcome. In some cases, however, the muscles remain flaccid and the limbs are swollen with an elephantiasic œdema; this is on account of the softening of the inferior portion of the cord. The phenomena of excitability, on the contrary, are observed in those cases where the autopsy reveals a secondary descending sclerosis. I need not insist in detail upon these symptoms, which have been very well described, especially by MM. Louis,

Cruveilhier, and Brown-Séquard,* nor upon the characters of the contraction, for it is in every respect identical with that of patients suffering from hemiplegia. I think that, in order to explain these facts, it is not necessary to consider that there is an accumulation of nervous influx in the inferior part of the cord; we have here an irritation of this inferior extremity, as M. Brown-Séquard thinks; but this irritation has its anatomical cause.

A woman in the wards of M. Charcot, suffering from an ulcerated cancer of the breast, the commencement of which dated back for six years, was suddenly seized with violent, lancinating pains in the lower extremities; for two months, however, the patient had enough strength to be able to walk with the assistance of a cane. At the end of this time, she became unable to stand and was obliged to keep her bed; her legs were flaccid and inert. About seventy days after the time when she became bedridden, her limbs commenced to become flexed, and this flexion, slightly pronounced at first, progressively increased. The legs were strongly flexed upon the thighs, the thighs were in a state of adduction with a certain amount of flexion. A considerable amount of resistance was experienced when we endeavored to extend the contracted limbs, and these attempts were very painful to the patient. The sensibility was preserved; there was a certain degree of hyperesthesia and some pains in the lumbar regions, with a very painful feeling of constriction around the abdomen and at the base of the lungs. Although purulent during the last few days of life the urine remained acid until death.

* Louis, *Recherches d'Anatomie Patholog.* Cruveilheir, *Anatomie Patholog. du corps humain.* Brown-Séquard, *Lectures on the diagnosis and treatment of the principal forms of paralysis of the lower extremities:* London, 1861.

The patient died the eighteenth of January, 1866, about six months after the commencement of the paralytic symptoms. The autopsy showed that the cord was compressed by a cancerous tumor of the first dorsal vertebra and by a purulent effusion in the canal, extending from the seventh cervical to the tenth dorsal vertebra. Independently of the ascending degeneration, in the cervical region, we found throughout the whole substance of the lateral columns of the lumbar enlargement, a considerable number of myelocytes and embryoplasmic nuclei. The muscles of the posterior portion of the thigh showed no transverse striae, either by direct or oblique light; the primitive fibres were studded with numerous fatty granules, (resisting the action of acetic acid;) the nuclei of the sarcolemma were extremely numerous.

In this case also, the contraction commenced about two months after the début of the paralysis, precisely at the period when the proliferation of connective tissue becomes developed in the secondarily degenerated columns. In another case of compression of the cord, by Pott's disease, which I examined at the hospital Sainte-Eugénie, with M. Triboulet, death having taken place one month and a half after the commencement of the paralysis, I noticed that the muscles were flaccid all the time, and at the autopsy I found only a fatty degeneration of the lateral columns below the seat of the lesion without any hypergenesis of the elements of connective tissue.

We see that the permanent contraction which is common to hemiplegias and to compressions of the cord, presents in both cases the greatest analogy as regards symptomatology; it is connected with an anatomical condition of the cord common to both these affections, and does not become developed in either case until the

time when the secondary sclerosis of the lateral columns commences. I should add that the permanent contraction of the extremities is seen to have the same characters in primary sclerosis of the lateral columns, as is shown by a remarkable case communicated by M. Charcot* to the Medical Society of the hospitals, as well as in certain cases of diffused sclerosis of the cord, affecting in a greater or less degree these same lateral columns, examples of which are to be found in a recent work presented by M. Vulpian,† to the same society. Why then, since in all these cases we observe common symptoms and common lesions, do we refer the contraction, in paraplegias, to the lesion of the cord; in hemiplegias, to a lesion of the brain?

This cerebral origin of the tardy contraction is not proved; it was admitted at a time when we were ignorant of the secondary alterations of the cord, and when we considered softening as a chronic encephalitis. It is based therefore upon a double error.

If we admit that the tardy contraction in hemiplegia results from a secondary sclerosis of the lateral columns, we shall have a reason for certain facts which would otherwise appear inexplicable. Thus, in compressions of the cord, the contraction of the inferior extremities is stronger than in hemiplegias, because in the hemiplegia the secondary sclerosis is only developed in the situation of one portion of the decussating encephalic fasciculus, while in the compression of the cord it occupies not only this entire fasciculus, but a certain number of long commissural fibres besides. Thus, also, in hemiplegias, the superior extremity is most often contracted, and is so to a greater degree than the lower extremity, because the

* Hystérie avec contracture sclérose des cordes latéraux, 1864.

† Note sur les scléroses en plaque de la moelle épinière, 1866.

decussating encephalic fasciculus is richer in nervous fibres in the cervical region than in the lumbar region, where it terminates in a point; the sclerosis, which is substituted for this fasciculus throughout its whole length, will therefore be more developed at the level of the origin of the nerves of the arm than at the point of departure of the nerves of the pelvic extremity. Thus, also, may we not say that if the thoracic extremity is strongly contracted, while the head is not perceptibly deviated, that it is because the rotator muscles of the head are partly supplied with nerves from the spinal accessory which arises from the lateral portions of the bulb and from the superior extremity of the cord at points which are not influenced by the secondary sclerosis, since, in this region, it is limited to the internal part of the anterior pyramids? But it might be objected that all hemiplegias are not accompanied by contraction. We can answer this objection by stating that there are certain cerebral lesions, as for example superficial lesions of the convolutions, which are capable of producing hemiplegia, and which do not determine secondary degeneration.

We might refer the tardy contraction to other causes, such as an alteration in the structure of the muscles due to the prolonged inertia, but we find complete hemiplegias which always remain flaccid; or to an atrophy of the muscles, resulting either from rest or from some other cause, but the contraction is found in 9 out of 31 cases, without there having been any atrophy of the muscles, and in one case I have found a certain amount of atrophy of the muscles of the arm, without any contraction. There are in reality alterations in the structure of contracted muscles coinciding with a fawn-colored appearance of their tissue; the transverse striae are often less marked than usual, sometimes ab-

sent, the substance of the primitive fasciculi is more or less granular, studded with fatty and pigmentary granules; the nuclei of the sarcolemma increase in number; 16 times out of 30 the size of the muscles diminishes.* If these alterations are the proximate cause of the contraction, of which we have no proof, nothing authorizes us to consider them as developed without the action of the central nervous system.†

Independently of the contractions, one quite important symptom seems to me to be attributable to descending degenerations, and more especially to the secondary sclerosis of the bulb. I refer to the epileptiform attacks and to those which are evidently epileptic, which we often meet with in subjects attacked with hemiplegia during infancy, and which are not infrequent in old persons suffering from softening, and in which we find at the autopsy considerable atrophy of a peduncle, of the pons and of the bulb. I must confess that this hypothesis does not as yet appear to me susceptible of a rigorous demonstration; but it seems to me to be

* Out of 30 cases of hemiplegia with contraction, I have 5 times observed an increase in size of the paralyzed limb, but this hypertrophy no doubt depended upon the œdema of the subcutaneous tissue rather than upon an alteration of the muscles.

† M. Charcot has called my attention to a very curious peculiarity of paralyzed and contracted muscles in hemiplegias of long duration: this is the absence of post mortem rigidity. At the autopsy the limbs of the healthy side present a perfect rigidity; on the contrary the muscles which were contracted during life are entirely flaccid. However, numerous examinations made at different hours after death have shown that usually the diseased muscles do not escape the post mortem rigidity, which is manifest in them almost immediately after death, and only for a very short time. The absence of cadaveric rigidity is seen also in infantile paralysis. It would be curious to find out whether putrefaction is developed more rapidly in the paralyzed limbs.

true, because in one patient suffering from an intense sclerosis of the bulb from compression of that organ, the epileptic fits were very strong and very frequent, and because when we saw him sometimes, a few moments previous to an attack, the contraction markedly increased in the paralyzed limb.

We very often see in cases of hemiplegia an increase in the size of the nerves, with vascularity and increased thickness of the envelope of connective tissue, often also with a deposit of fatty globules in its interstices. I do not know whether this kind of hypertrophous neuritis, to which M. Charcot, and after him M. Cornil,* have called attention, depends upon secondary degeneration of the cord, or whether it is not solely the result of inertia; at all events, it seems to be connected with those pains, often quite severe, already pointed out by Remak, which the hemiplegies feel in the paralyzed arm, pains which are increased by pressure along the course of the nerve, and which are often alleviated by the application of a blister, as M. Charcot has several times proved.

As for the alterations of nutrition, such as the atrophy of the compact tissue of bone, the squamous condition of the skin, &c., I doubt whether they can be referred to the secondary degeneration of the cord.† This degeneration, besides, does not modify in any re-

* Note sur les lésions des nerfs et des muscles liées à la contracture tardive et permanente des membres dans les hémiplegies. (Comptes-rendus de la Société de Biologie, 1863.)

† As for the articular alterations, which are of frequent occurrence, they depend evidently only upon the immobility, and differ in no respect from those which are produced by that cause, outside of any influence of the nervous system. Upon this subject consult Teissier, Mémoires sur les effets de l'immobilité longtemps prolongée des articulations. Lyons, 1844.

spect the phenomena of calorification which we observe on the side of the paralyzed limbs. The paralyzed hand is always the warmer, even at a time very distant from the commencement of the symptoms, and we sometimes find considerable variations in the temperature of the two sides of the body.*

The examination of five patients, made with this object in view, has furnished me with the following results:

Age.	Date of commencement.	Paralyzed hand.	Healthy hand.
70 years.	Several years.	95.3°	89.6°
42 "	14 months.	95°	89.9°
72 "	12 years.	99.3°	98.6°
65 "	5 "	97.8°	97.5°
51 "	14 months.	97.1°	95°

Thus far I have only spoken of the symptoms of descending degeneration; the secondary ascending scleroses do not appear to betray themselves by a single symptom. We might however imagine that this sclerosis of the posterior columns could determine the phenomena of motor ataxy in the upper extremities, but it is not so; and this is explained by the separation which the intermediate posterior sulcus establishes between the centripetal fibres of the pelvic and those of the thoracic extremities. Even in cases of compression of the cord in the cervical region, when the secondary sclerosis also affects the external fasciculus of the posterior column, it is probable that we should not find symptoms of ataxy. In fact, ataxy supposes the destruction of a certain number of nerve tubes, and secondary sclerosis does not appear to destroy the healthy tubes which are plunged into its interior; it only deforms them and may exalt their activity, but does not annihilate them.

* According to M. Routier, there should be a diminution of the temperature of the paralyzed side immediately after the attack. The elevation of the temperature only comes on at the end of twelve or twenty-four hours. (A. Routier, Théses. Paris, 1846.)

In conclusion, I will state that these cases which I have gathered at Sainte-Eugénie, with M. Triboulet, and two others which I have studied at the Salpétrière with M. Charcot, warrant me in affirming that a cure is possible, even when the columns of the cord seem to have undergone secondary degeneration. In these five cases there was complete paraplegia due to the compression of the cord by Pott's disease. In four cases, sensibility and motion have returned in all their integrity; in only one, motion, without having recovered its entire liberty, nevertheless allows the patient to walk. In this case the paraplegia was flaccid; in the others it was accompanied with contraction. We may therefore conclude that the nerve tubes of the cord may be regenerated like those of the peripheral nerves, not only in the child but also in the adult, and even when the degenerated fasciculi have already been the seat of a hypergenesis of nuclear elements.

SECONDARY DEGENERATIONS OF THE SPINAL CORD.

EXPLANATION OF THE PLATE.

FIG. 1. Secondary degeneration of the mesocephale in an old softening of the right hemisphere. Atrophy and gray color of the right peduncle. Flattening of the Pons Varolii on the right side. Atrophy and gray color of the right anterior pyramid. Gray discoloration in the left lateral column below the bulb.

FIG. 2. Histological lesions in the first stage of secondary degenerations.

- a. Granular bodies.
- b. Vessel with fatty granulations accumulated in the lymphatic sheath.
- c. The same granulations, but more numerous, in the lymphatic sheath at the point of bifurcation.

FIG. 3. Histological lesions in the later stages of secondary degenerations.

- a. Myelocyte.
- b. Vessel with numerous nuclei and very few fatty granulations in the sheath.
- c. Amyloid body.

FIG. 4. Section of the cord in the dorsal region in a case of old secondary degeneration of the posterior columns.

- ac and a'c. The posterior columns.
- bc and b'c. The portion of these columns where the tubes are scanty, separated by the connective tissue of new formation.

FIG. 5. Sections of the cord in a case of old lesion of the left hemisphere. The parts colored black indicate the points of location of the secondary degeneration.

- a. Cervical enlargement.
- b. Dorsal region.
- c. Lumbar enlargement.

FIG. 6. Descending degeneration in a case of compression of the cord at the upper part of the dorsal region.

- a. Section made a few centimeters below the compression.
- b. Inferior portion of the dorsal region.
- c. Lumbar enlargement.

FIG. 7. Ascending degeneration in a case of compression of the cord at the lower part of the dorsal region.

- a. Section made a few centimeters below the compression.
- b. Superior portion of the dorsal region.
- c. Middle of the cervical enlargement.
- d. Superior portion of the cervical enlargement.

FIG. 8. Secondary degeneration in a case of compression of the cauda equina.

- a. Inferior portion of the lumbar enlargement.
- b. Superior portion of the lumbar enlargement.
- c. Middle of the dorsal region.
- d. Middle of cervical enlargement.

Fig. 5

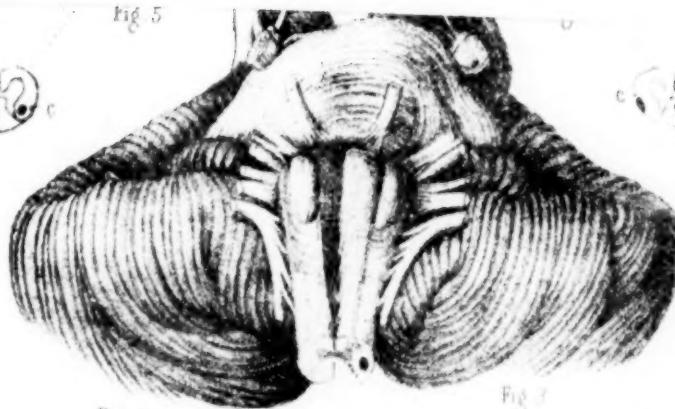


Fig. 2

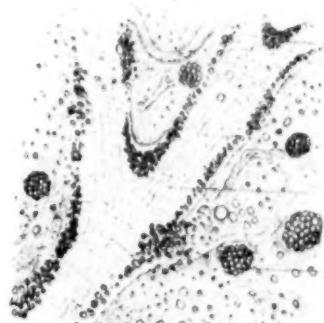


Fig. 4.

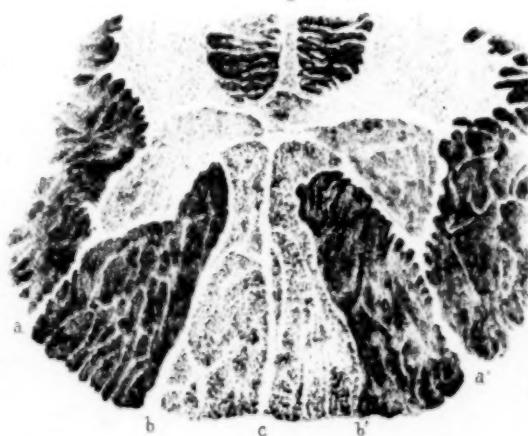


Fig. 7.



LEADER & SONS del.

Imp. Bequet Paris

PRINTED IN THE U.S.A. BY THE NATIONAL STAMP CO., NEW YORK CITY.

Plachetka 6th

444

Journal of Insanity.

[April,

SECONDARY DEGENERATIONS OF THE SPINAL CORD.

CH. BOUCHARD.

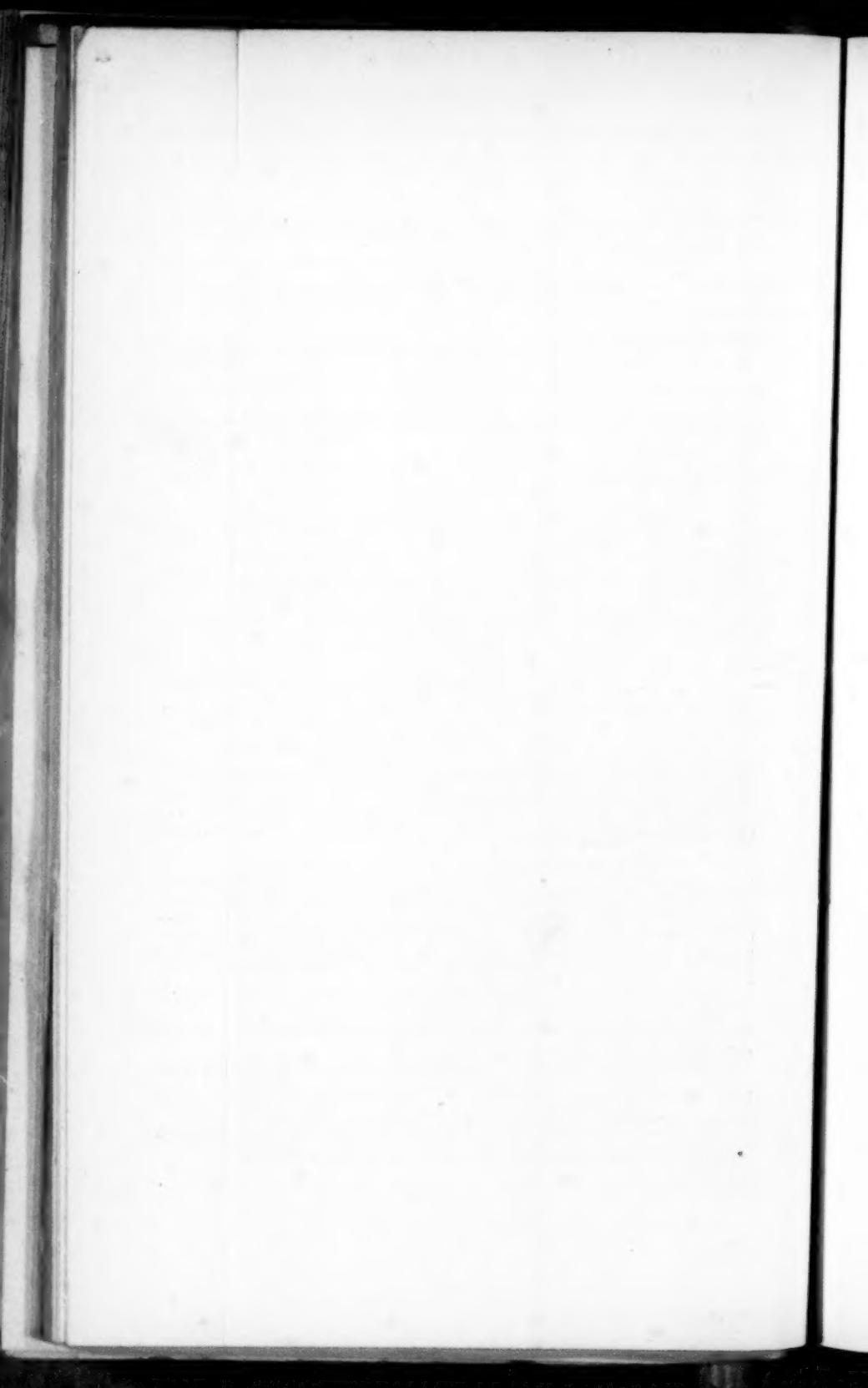
AGE.	DURATION.	SIDE PARALYZED.	CONDITION OF THE MUSCLES.	SHOULDER.	ARM.				FOREARM.				HAND.	FINGERS.	THIGH.		KNEES.	FEET.			
					ADDITION.		(1) ROTAT'N.	CIRCUM FLEX'N.	ROTAT'N.		CIRCUM				EXTEN.	ABDUCT.					
66	4 mos.	left.	feeble.	lowered.	slight.	inward.	30	30 100°	pron.	1st.	24	26 flex.	slight.	flex. strong.							
69	3 yrs.	left.	quite strong.	lowered.	slight.	inward.	19	20 135°	pron.	1st.	20	20		flex. slight.							
50	18 mos.	right.	quite strong.	lowered.	slight.	inward.	24	25 45°	supina.	21	22 ext.	slight.	flex. strong.								
59	6 mos.	right.	flaccid.				32	34 (2)		27	27										
70	2 yrs.	right.	strong.		very slight.	inward.	(3)	70°	pron.	2d.		flex. strong.	flex. of the 1st phal.	exten.	abduct.	semi-flexed.	equin. slight.				
44	5 yrs.	right.	very feeble.	lowered.	very slight.	inward.	27	29 135°	pron.	1st.	24	25 flexion	1 very slight.	flex. quite strong.							
67	9 mos.	left.	very feeble.	lowered.		inward.	17	17 150°	sup.	slight.	19	18		extension.	exten.		equin. slight.				
56	1 yr.	right.	feeble.	elevated.		inward.	24	24 110°	pro.	slight.	21	20		flex. of the 1st phal.			equin. very slight.				
67	3 yrs.	right.	Triceps rigid				21	23 exten.	pron.	1st.	19	21		flex. strong.			equin. quite marked.				
33	13 yrs.	right.	very strong.	lowered.			23	26 90°	pron.	1st.	22	24 flexion	1.	flexion.			equinus.				
70	sev. yrs.	left.	strong.	elevated.	quite strong.	inward.	14	14 70°	pron.	2d.	13	15 flex.	strong.	flexion.			slight talus.				
42	14 mos.	left.	feeble.	lowered.		inward.	25	26 130°	sup.	slight.	25	26 ext.	slight.	flexion.	exten.	abduct.	flexion.				
56	18 yrs.	right.		lowered.			28	28 120°	pron.	1st.	24	24		flexion.			equin. slight.				
75	12 yrs.	right.	very strong.			inward.	22	24 30°	supina.	19	22 flexion	1.	flexion.								
66	5 yrs.	right.	quite strong.	very elev.		inward.	15	16 extens.	prob.	1st.	17	17 flexion	n.	flexion.	abduct.	very flexed.	talus.				
51	14 mos.	left.	feeble.	lowered.			25	27 extens.	pron.	1st.	26	26		flexion.	abduct.						
79	18 mos.	left.	feeble.	lowered.			20	21 150°	pron.	1st.	18	19 exten.	s. very slight.	flexion.							
				strong in the fingers.									slight.								
76	10 yrs.	right.	quite strong.	elevated.	slight.	inward.	18	20 130°	pron.	2d.	18	19 exten.	sion.	flexion.	flexion.		equin. slight.				
40	1 yr.	right.	quite strong.	lowered.	slight.	inward.	18	18 90°	pron.	1st.	18	19 flexion	1.	flexion.							
68	sev. yrs.	left.	strong.	elevated.	abduct.	inward.	16	17 30°	pron.	2d.	16	18 very	slight	ver slight	exten.	abduct.	flex.	equinus.			
67	2 yrs.	right.	strong.				24	24 135°	pron.	1st.	23	23		flexion.							
69	1 yr.	left.	feeble.	elevated.			21	22 150°	pron.	2d.	21	21 flex.	slight.	flexion.	ab.	slight	flex. slight.	equinus.			
74	10 yrs.	right.	quite strong.	elevated.	adduct.		23	25 135°	pron.	2d.	21	21 flex.	slight.	flexion.							
66	3 yrs.	left.	feeble.	lowered.			23	24 135°	pron.	1st.	21	23 flex.	slight.	flex. slight.							
68	1 yr.	left.	very feeble	elevated.			17	20	pron.	2d.	17	19		flexion.							
				except the fingers.																	
77	sev. yrs.	right.	feeble.			inward.	21	21 90°	pron.	2d.	20	21		flexion.							
72	2 yrs.	left.	quite strong.	elevated.	adduct.		22	22 120°	supina.	23	22 flexio	n.	flexion.								
67	3 yrs.	left.	quite strong.	lowered.			29	29 120°	supina.	24	23 ext.	slight.	flexion.								
61	3 yrs.	left.	feeble.	elevated.	adduct.	inward.	24	24 115°	supina.	23	23 flexio	n.	flexion.			flex.					
65	8 yrs.	left.	quite strong.	lowered.			25	25 130°	pron.	1st.	22	23 flex.	slight.	flex. slight.							
76	2 yrs.	right.	strong.	elevated.	adduct.	inward.	22	22 45°	pron.	2d.	19	20 flexio	n.	extension.	abduct.	flexion.					
74	2 yrs.	right.	very feeble.				27	26 150°	pron.	1st.	24	22		flexion.							

Nota.—In this table, comprising the analyses of 32 old cases of hemiplegia, the *blanks* indicate an indifferent position of the articulations owing to muscular flaccidity.

(1) In the columns giving the circumference of the arm and that of the forearm, the numbers indicate centimetres, the first referring to the paralyzed and the second to the healthy arm.

(2) In this case all the articulations were in an indifferent position; it is the only case of flaccid hemiplegia.

(3) Neither the circumference of the arm nor that of the forearm are indicated, as it was impossible to know whether the paralyzed limb was atrophied, the patient having suffered amputation of the non-paralyzed limb.



OBSERVATIONS ON A FORM OF NERVOUS PROSTRATION, (NEURASTHENIA,) CULMINATING IN INSANITY.

BY E. H. VAN DEUSEN, MEDICAL SUPERINTENDENT OF THE MICHIGAN ASYLUM FOR THE INSANE.*

Our observations have led us to think that there is a disorder of the nervous system, the essential character of which is well expressed by the terms given above, and so uniform in development and progress, that it may with propriety be regarded as a distinct form of disease. Though analogous with, and presenting in certain cases a few symptoms similar to those found occasionally in irregular forms of malarial disease, the difference between the two morbid conditions is well marked, and easily recognized.

Among the causes, excessive mental labor, especially when conjoined with anxiety and deficient nourishment, ranks first. It is also traceable to depressing emotions, grief, domestic trouble, prolonged anxiety and pecuniary embarrassment; hemorrhage and debilitating diseases, following or coincident with depressing mental influences and sleeplessness. Prolonged exposure in a malarial region under certain circumstances may also induce it.

Its leading symptoms are general *malaise*, impaired nutrition and assimilation; muscular atonicity, changing the expression of the countenance; uterine displacements, with consequent results, and neuralgias of debility, cerebral anaemia, with accompanying tendency to hyperesthesia, irritability, mental depression, impaired intellection, melancholia and mania. In cases terminating

* Supplement to Annual Report for 1867 and 1868.

fatally, death ensues from exhaustion, or from coma, with extensive sub-arachnoid effusion.

If an individual exposed to malaria is in robust or usual good health, and the exposure be recent, we may have the ordinary phenomena of intermittent fever, as generally met with in all malarial districts. If the reverse be the case, and the resistive power of the individual be less, the result is often a series of neuralgic affections and disabilities, of frequent occurrence in the experience of every practitioner of medicine; but occasionally, when the struggle is prolonged and under circumstances of a peculiarly depressing character, the nervous system is weakened and its functions become disordered, the secretions are more or less deranged, digestion is enfeebled, the patient becomes irritable and depressed, and serious intellectual disturbance ensues. Thus may malaria develop the morbid condition now under consideration.

In by far the larger proportion of cases, however, which have been presented for treatment in this Institution, malaria can have had no influence, either recent or remote, in the causation of the disease. In most of them there had been a coincidence of depressing influences under which even the most robust and healthy organizations have finally yielded.

The exhaustion consequent upon protracted attendance at a sick bed, with loss of sleep and irregular meals, solicitude as to the final issue, and, in case of a fatal termination, the shock of the bereavement, is a cause. It has occurred, too, in the persons of those occupying positions of great responsibility, the duties of which were of a nature to make heavy demands upon the nervous energies of the individual, and at the same time deprive him of the large amount of sleep rendered requisite by the exhausting labors of the position.

The early married life of the wives of some of our smaller farmers seems especially calculated to predispose to this condition. Transferred to an isolated farm-house, very frequently from a home in which she had enjoyed a requisite measure of social and intellectual recreation, she is subjected to a daily routine of very monotonous household labor. Her new *home*, if it deserve the name, is, by a strict utilitarianism, deprived of everything which can suggest a pleasant thought: not a flower blooms in the garden; books she has, perhaps, but no time to read them. Remote from neighbors, as in sparsely settled districts, for weeks together, she sees only her husband and the generally uneducated man who shares his toil.

The urgency of farm work necessitates hurried, unsocial meals, and as night closes in, wearied with his exertions, the farmer is often accustomed to seek his bed at an early hour, leaving his wife to pass the long and lonely evening with her needle. Whilst the disposal of his crops, and the constant changes in the character of farm labor afford her husband sufficient variety and recreation, her daily life, and especially if she have also the unaided care of one or two ailing little children, is exhausting and depressing to a degree of which but few are likely to form any correct conception. From this class come many applications for the admission of female patients.

The hot-house educational system of the present day, and the rash, restless, speculative character of many of our business enterprises, as well as professional engagements, are also strongly predisposing in their influence to debilitating forms of nervous disorder.

Among the earlier symptoms is an impaired appetite, and perhaps slight loss of flesh, but with a degree of mental and physical languor singularly disproportionate

to the other symptoms and circumstances of the case. The careful observer, having his attention directed to the imperfect assimilation due to the loss of nerve tone, will often detect a marked excess of urea. To the same deranged functional action of the kidneys may be traced the strange drowsiness occasionally observed. In a patient treated here in 1860, in whom this somewhat unusual drowsiness was well marked, it was found that the urine nearly semi-solidified on the addition of nitric acid. As a general rule, however, the urine in these cases is paler than in health, and is secreted in larger quantities.

A succeeding symptom is marked muscular atonicity, manifest in the position and gait, and which often singularly changes the expression of the patient, more particularly of the mouth and the lower portions of the face, and especially so in females. Thus the approximation to a more natural expression marks the progress towards restoration. To the same muscular atonicity is attributable the frequent occurring uterine displacements, and the distressing train of accompanying symptoms.

Irritability and hyperesthesia, increasing proportionally with the increasing nervous prostration, we have next a new series of morbid manifestations—the neuralgias on the one hand, or disordered intellect on the other—developed in accordance with the direction of the morbid action. With these neuralgias we have, in this connection, very little to do, and will dismiss them for the present, with a few remarks relative to the difference existing between them and similar neuralgic developments in certain forms of malarial disease.

Physicians practising in malarial districts are familiar with the multiform nervous phenomena, occurring as a

consequence of exposure to the malarial poison, so frequently met with in certain localities. They are constantly meeting with neuralgic and morbid mental manifestations, sometimes carried even to the point of maniacal excitement, all solely attributable to the effects of this strange poison. They find no difficulty in detecting their nature and cause, and applying suitable remedies. Many of our physicians, also, are perfectly familiar with the particular ailment now under consideration, and have readily recognized the points of differential diagnosis.

As a general rule in the malarial neuralgias, when once located there need be little apprehension of further complication or transfer to any other portion of the nervous system, but not so in the neurasthenic. In these we have the premonitory symptoms before alluded to, and even, as previously remarked, if the direction of the morbid action for the time being develop a simple neuralgia, judicious treatment alone can arrest the tendency to mental complication. The recognition, therefore, of this form of nervous disorder, the presentation of a few hints as to the agency most likely to arrest this tendency, and the course of treatment we have found most efficacious in the mental alienation accompanying it, is the object of this paper.

As to the term *neurasthenia*, it is an old term, taken from the medical vocabulary, and used simply because it seemed more nearly than any other to express the character of the disorder, and more definite, perhaps, than the usual term "nervous prostration."

Secondary to the earlier symptoms of irritability and the depression of the vital power already mentioned, is a marked tendency to hyperæmia. The earlier morbid conditions having failed to attract attention, it is not strange that observers have occasionally regarded one

of these located hyperæmias or congestions as the *fons malorum* itself.

In the case of all patients who have suffered from nervous prostration for any length of time, cerebral anaemia may be anticipated, and when, coincident with irritability, it exists as a secondary result, or, in consequence of impaired digestion and assimilation, cerebral hyperæmia, with its distressing train of symptoms, is very readily induced, by any cause calculated to quicken the circulation. Hence the importance of great caution in protecting the patient from influences likely to produce this.

To this circumstance is due the fact that neurasthenic patients seldom tolerate the use of alcoholic stimulants. A single teaspoonful will often produce flushing of the face, burning heat of the eyelids and distress in the head. Mental emotions, ill-timed interviews with friends, and the injudicious acts and remarks of an attendant may also speedily induce an unpleasant hyperæmia.

It is a well recognized fact in mental pathology, that in the asthenic the earliest marked morbid psychical symptom is *distrust*. It is true that this is usually preceded by irritability and other modifications of temper and disposition—grave symptoms always—which should promptly receive the attention both of physicians and friends, but, as before remarked, the first clearly marked morbid sentiment is *distrust*. If the sufferer be an individual of deep religious feelings, to whom there is but the one only, great and vital interest, there is distrust of God's promises, morbid views of personal relations to the church, and to society—in fine, what is improperly termed “religious melancholy.” If the acquisition of gain and the possession of broad acres have been the great object of life, there are torturing apprehensions of poverty; the poor-house stares the patient in the face,

and pauperism is his inevitable fate. Title deeds are filled with flaws, his notes are forgeries, and even gold and silver to him are worthless. If the conjugal relations have been peculiarly close and tender, there are the tortures of jealousy. In a few exceptional cases the morbid feeling has been general in its application.

If at any time during this stage there occurs a *sudden and entire* change in sentiment; if hope takes the place of despair, and the jealousy and suspicion be suddenly supplanted by the opposite sentiments, it almost invariably betokens still greater prostration, and but a trifle more will then be required to develop mania.

As before observed, in the earlier stages, through deficient innervation, there is derangement and suppression of secretion, and, as would naturally be expected, very uniformly in female patients, menstrual suppression. If, through a misapprehension of the character of this suppression, active emmenagogues and uterine excitants be resorted to, with the view of forcing the organ to a resumption of its function, the attempt will not only fail, but will induce uterine and vaginal hyperesthesia, create delusions of a most unpleasant character, and sometimes develop an almost uncontrollable furor uterinus. So, also, when dyspepsia is the prominent symptom, an analogous course of treatment will frequently cause great local distress, and often develops delusions of apprehensions of personal danger from poison with a disposition to refuse food under the influence thereof. Uterine displacement with leucorrhæal discharge, is very commonly present, and at some stage is apt to be the most prominent difficulty under which the patient labors. Through muscular atonicity the organ sinks and finally rests upon the vaginal walls, the pressure producing congestion, ulceration and discharge. In several cases admitted here, the condition of the patient

from this cause had become one of great misery; still in no single instance has it become necessary to resort to any local treatment whatever, and in no case has there been a failure to give the patient entire and permanent relief by remedies addressed to the constitutional condition solely.

Headaches are not a prominent or frequent symptom, except as an accompaniment of cerebral hyperæmia, and sometimes, perhaps, when it occurs in association with uterine irritability.

Sleeplessness is a common and, at certain stages, a most distressing symptom. As previously observed, drowsiness sometimes occurs as a consequence of disordered renal function; it may likewise depend upon venous cerebral hyperæmia. Healthy, refreshing sleep is of course not to be expected under such circumstances. As the debility increases, the morbid irritability and activity increase therewith, and maniacal excitement soon follows.

A few patients, especially, in the earlier history of the attack, suffer from wakefulness only during the earlier hours of the night. When, through the composure induced by quiet and the recumbent position, the circulation is equalized and the cerebral hyperæmia relieved, a few hours of healthful and natural rest is enjoyed. To this is due the frequent statement of these patients that they sleep much better towards morning than at any other time.

A profuse, saturating perspiration is another frequent, and to the patient, very annoying and distressing symptom. Its occurrence usually accompanies extreme nervous prostration, and very clearly indicates the character of the remedial agency to be employed. It may occur at any hour of the day, and may or may not be preceded by shiverings; more commonly, however, the patient

falls into a profound sleep after a few hours of restless tossing, and on awakening from his brief rest, finds himself bathed in perspiration, his clothing, and sometimes a portion of the mattress and pillow saturated.

At a still later stage, when the exhaustion is very profound, copious, oft-recurring mucous stools frequently occur. They are sometimes of a very offensive and nearly putrid odor, a circumstance supposed to be due to the acknowledged tendency to spontaneous decomposition, which accompanies low vital power. So, also, the urine is often found of very disagreeable odor, and probably from a similar cause. The breath sometimes is so fetid as to suggest mercurial sore mouth; indeed, the room occupied by a patient in this stage of the disease, unless it be thoroughly ventilated, is pervaded by a peculiarly characteristic and unpleasant odor.

In two cases ascites existed, and was at first a puzzling symptom. The sounds of the heart being modified, in a measure, by the impaired character of the blood driven through it, a cardiac complication might be suspected by an inexperienced auscultator. The condition disappeared as the patient improved; and where it thus exists, it is probably to be relieved only by restoring the tone of the system, and thus constricting and rendering firmer and closer the coats of the weakened and relaxed vessels. When a portion of the skin is taken up and pinched into a fold, it very slowly returns to its position. By comparing this want of natural elasticity from time to time, a tolerably correct opinion can be formed of the progress towards restoration.

Through deranged innervation, and cutaneous hyperæsthesia dependent thereon, patients sometimes experience very strange sensations. In the case of a lady under our care, no amount of atmospheric heat, and no application of clothing, could change in the least these morbid

sensations. Warm as the room could be made, and wrapped up in blankets and shawls, she still complained of cold.

In our experience, after convalescence commenced there has been no tendency to relapse. The improvement, both mental and physical, has been *pari passu*, and in no case has there been a return of the disease.

Although it is generally supposed, that masturbation and venereal excesses rank among the most potent causes tending to debilitate the nervous system, the most careful investigation has failed to show, in a single case of this disorder, any reason to believe that these improper indulgences could be correctly assigned even as a predisposing cause.

During a single season, three cases were presented, two in the persons of ministers of the gospel, and the third, a member of a clergyman's family. Each were well-marked instances of this form of disorder; in each, over-exertion and an insufficiency of healthy, nutritious food was the undoubted cause. Not one of them had ever resided in a malarial region previous to the commencement of treatment. Under the use of nerve tonics, and a nutritious and easily digested diet, speedy restoration followed in each case.

We cannot but regard the *early recognition* of this condition as of special importance, convinced that properly directed treatment will, in the larger proportion of cases, stay its progress. In the analogous affections of malarial origin, a few months delay is not of vital moment, and a change of residence, to a mountainous region or a sea-side district, is often sufficient in itself to effect restoration. In the neurasthenic, the morbid tendency is strongly *progressive*. If, in the early neuralgic stages, a course of medical treatment analogous with that employed in malarial neuralgias be instituted, with

proper general hygienic measures, a cure may be anticipated. Sciatica is by far the most frequent form of neuralgia accompanying neurasthenia. The blisters, counter-irritants and purgatives, so efficacious in the sthenic form of the disease, are of no service—on the contrary, usually aggravate the symptoms. Relief from intense pain, to secure sleep and preserve the strength of the patient, may be procured by the hypodermic use of the acetate of morphia, which will generally be found successful. This, with a carefully conducted course of nerve tonics has, in the cases coming under our observation, uniformly restored the patient to his previous health.

Where, however, there is present instead of the neuralgic pains, depression of spirit, irritability and disturbed sleep, there is evidenced a location or direction of the morbid action, which should create the liveliest apprehension and induce prompt treatment. Proper hygienic and medical agencies, with relief from previous cares and anxieties, and change of scene and occupation, will, we think, in the larger proportion of cases, preserve the patient from confirmed melancholia or mania. These are the only forms of mental alienation in our experience associated with neurasthenia. Hypochondriasis has not been recognized in a single case.

In the organization of those portions of the nervous system designed more especially for the performance of the mental functions, or intellection, there is found a far more liberal supply of blood-vessels than elsewhere. This shows an anticipation of more rapid tissue destruction here, and at the same time provides a medium of nutritional repair and renewal, properly proportioned to the extreme requirements of this portion of the organization. Through this medium the remedial and preventive efforts must mainly act. Whatsoever agency

therefore, or hygienic influence, can be made to improve nutrition and enrich the blood will be curative, and will act in the right direction.

The mysterious fluid or whatsoever it may be, the normal constitution of which is essential to the healthy action of the nerves, seems thereby to be restored or corrected. The several organs again receiving a healthy nerve influence, resume the proper discharge of their respective functions. Assimilation is rendered perfect, digestion becomes vigorous, the muscles are toned, the liver, kidneys and skin perform aright their important duties, the brain function also is healthfully and naturally performed, and the work of restoration is complete.

It must be borne in mind that we have not failed to recognize the fact, that loss of nervous power, does much more largely than heretofore, characterize many of the disorders now presented for treatment. Cases of well-marked asthenic mania and melancholia are also frequently received and easily enough recognized. The intellectual disturbance, in the cases under consideration, is not sympathetic with physical derangement, nor due, either to the sluggish action of eliminating organs or to the circulation of impoverished blood, but seems to be purely a functional derangement, strictly identical in character with the neuralgia, the muscular atonicity and the other evidences of deficient innervation preceding it; the brain, as under other morbid agencies, being slow to yield to disturbing influences.

This peculiarity in the character of the psychical disturbance, and the fact, that in a large number of cases submitted for treatment, this, and the other symptoms previously enumerated, have observed a uniform order of sequence, have led us to regard it as a distinct form of disease, which, as a matter of convenience of record, we have placed under one head.

The *moral treatment* is the same as that adopted in corresponding forms of mental alienation from any other cause, and is conducted on the same general principles.

Frequent and long-continued gentle exercise in the open air is of great service in relieving the morbid irritability. It should never be carried to the point of fatigue. Its quieting influence is well shown in the effect of a slow, lounging walk about the grounds by this class of patients. An individual laboring under a considerable measure of maniacal excitement becomes calm and composed, while the same exercise in a corresponding state of sthenic maniacal excitement would still more disturb.

In the earlier stages, *recreative occupation* is a term expressing the exact requirements of the patient in this direction. Physical exercise and occupation, to be of any special service must be recreative and of a character to engage the thoughts of the individual healthfully. It should secure the satisfaction of some useful object or purpose fully attained. If it does not fully occupy and engage the attention, it must constantly remind the patient of his invalidism, and thus fail entirely in securing the object suggesting it.

As a relief for the depression, traveling is very likely to be suggested, but is very seldom beneficial. The different stages of a journey cannot be so arranged as to secure regularity in sleep and in taking meals. The mode of preparing the food and its character cannot be made to meet the requirements of the case. Ideas and thoughts are presented and suggested so rapidly as to cause great weariness, and it is not at all unfrequent to meet with instances, in which a patient leaving home suffering from depression simply, returns more deeply melancholic, or even maniacal.

The form of mania in its more general features, does

not differ decidedly from asthenic mania, at the same time it is of the utmost importance to distinguish between the two. The usual treatment of acute mania with great prostration, by hyoscyamus, or by hyoscyamus, morphia and camphor, brandy and the prolonged hot bath, is inadmissible in cases of neurasthenic mania, death usually ensuing from coma, and sometimes, with great rapidity. The use of tart. ant. et pot., which so pleasantly arouses secretion in sthenic mania, and thus renders efficient the anodynes indicated, is here of no service and does positive harm.

Sponge-baths, while the patient is lying in well-warmed blankets, with brisk and prolonged spirit frictions, is very soothing in its effects, insomuch that patients have fallen asleep during the process, as in the hot bath in sthenic mania. While this is being administered, a few spoonfuls of beef-tea at occasional intervals, or a little wine in extreme cases, may be necessary. When an equality of temperature between the head and the extremities is established, and the skin has become warm, moist and natural, small quantities of wine, or a teaspoonful of brandy, prepared with milk and egg, should be cautiously administered in small quantities, at stated intervals.

When there is great irritability of the stomach—a very common symptom—a teaspoonful or two of champagne, or of water charged with carbonic acid, may be given with advantage through a syphon, with sinapisms to the epigastrium. When there is reason to suspect hyperæmia of the stomach, the tendency to vomiting continuing with pain on pressure, ice-cream and nutritious gelatines should be the principal diet.

In treating the melancholia of this class of patients, morphia, of such marked service in other forms of mental depression, is inadmissible.

Quinine, in the experience of this Institution, ranks first as a nerve tonic. The cases in which it is not tolerated are very rare. Though accustomed, except in extreme cases, to defer its administration until attention has been given to the secretions, it is not necessary or advisable to await the cleaning of the tongue. Indeed, in many cases alteratives have but little influence in this direction until the use of the quinine has sufficiently toned the nervous system to secure their proper application and effect. It appears to be contra-indicated only where there exists a very marked tendency to cerebral hyperemia, and then only at particular stages of treatment. It is usually given in single grain doses, rendered soluble by five or ten drops of dilute phosphoric acid, repeated four times daily.

Arsenic has, in very many instances, proved itself a most efficient remedy. It has been especially beneficial in cases marked by considerable irritability, with emaciation, and the ill-conditioned skin occasionally met with. Under its use in this class of patients, the skin soon becomes smooth and fair, flesh is gained rapidly, and the irritability proportionally decreases. The instances, however, in which it disturbs the stomach, and is intolerable, are not few; and when this intolerance really exists, it is manifested towards even the smallest doses. It is generally well adapted to cases in which quinine is, for any reason, contra-indicated. At the same time, as an antiseptic, it probably arrests the rapid tendency to tissue disorganization characterizing this form of disorder, and it is our opinion that in the earlier stages it will be found of great service. It may be ranked as a *nerve nutrient*.

Strychnine is most serviceable in cases accompanied by intestinal torpidity and muscular atonicity. It has been prescribed, also the ext. nuc. vom. in combination

with the vegetable bitter extracts and taraxacum. As an efficient laxative in these cases—and often unaided—its action is decided. In the case of a female treated here, a moderate dose of the solution in the evening, followed by a second early in the morning, invariably afforded pleasant relief a few hours afterwards. It is much less likely than arsenic to disturb the stomach. In the dyspepsia of the neurasthenic it has always acted well, and no other remedial agent in our hands is more sure and positive in the direction of its action. Whenever the morbid action may be, there will this singular agent be found manifesting its presence.

Iron and its various preparations, we have come to regard, as of but little positive service in the earlier treatment of the severer cases presented. It seems to be of much service, only after there has been secured some measure of nerve force; and that form should be used, which, by actual trial is found best suited to the particular case under treatment. When the malaise, restlessness and irritability is persistent, a very efficient formula is the one introduced many years ago, and known as the Mist. Conii et Ferri. We can easily understand the strong preference expressed for it by the older practitioners. It is not at all unpleasant to the taste, and is almost invariably tolerable. The preparation of iron entering into its composition here, is the soluble ammonio citrate.

Phosphorus, though considered an efficient renovator of nerve tissue and nerve power, has not, in our hands, given such satisfactory results as to lead to its very frequent administration. It is quite possible that its specific effect would be more marked in the earlier stages of the disorder. In combination with the phosphate of iron, it is especially valuable in chlorotic females, in whom the blood impoverishment is due to impaired assimilation from defective innervation.

Skillful pharmacists have recently placed in the hands of the profession many attractive preparations, the constituents of which would seem to adapt them almost perfectly to the precise requirements of this class of patients. In treatment at this Institution, however, we have had more satisfactory results from extempore prescriptions. Careful daily observation at the bedside will detect many slight variations in symptoms, indicating corresponding modifications of prescription. The combination of remedies used, are presented in the histories of the cases prepared to illustrate this subject. These, with the statistical tables covering our experience in this form of disorder, necessarily omitted in this, will be given in full in a future report.

THE LATE PROFESSOR GRIESINGER.*

We proceed to give some account of the life, character and labors of this eminent man, in fulfillment of the promise made to our readers in the announcement of his death in the January number of this JOURNAL.

WILLIAM GRIESINGER was born at Stuttgart, on the 29th day of July, 1817. His father was steward of the hospital there, and upon him as such the chief administrative functions of the establishment devolved. Young Griesinger received his primary education at the Gymnasium. Here both Roser and Wunderlich were his fellow students; all having been born in the same street in Stuttgart. From one of these we learn that at the

* Archiv. fur Psychiatrie. Transactions of Berlin Psychological Society. Memorial Addresses of Drs. Westphal and Lazarus. Gedenkfeier fur W. Griesinger in Wien. Addresses of Dr. Billroth and Baron Mundy.

Gymnasium, Griesinger always had the reputation of being first in everything, without appearing to work any harder than others. In the spring of the year 1834, he entered the University of Tubingen. At the completion of his studies here, he repaired to Zurich, to attend upon the instructions of Schonlein. The clinics at Zurich were at that time attracting much attention by the brilliancy of Schonlein, and Griesinger availed himself of these advantages in further completion of his studies.

In 1838, he took his degree at Tubingen, with a dissertation on diphtheritis: a disease which was ultimately to demand his own life. After remaining for a time in Paris, he settled as a practising physician in Friderichschafen. Here a circumstance occurred which was to influence in a most extraordinary manner his future course of life. He was advised by his friend Wunderlich to take the place of assistant physician of the institution for the insane, at Winneuthal, in Wurtemburg, and he followed the counsel. Here a new world was opened to him, into which he entered and labored with great enthusiasm and an undivided interest. Here he formed the most intimate and friendly relations with the medical superintendent Dr. Zeller, which continued to the end of his life. Later, he often spoke of the happy days he spent in Winneuthal, as the brightest of his life. After his marriage, his first care was that his wife should visit this beloved place with him, and learn something of it, and of Zeller. And subsequently when in Cairo, uneasy and depressed by the weight of his position, he was often heard to express a wish that he might ultimately find a place of rest in Winneuthal. That these heartfelt and friendly relations between him and Dr. Zeller should have continued so strong to the end, is made more curious by the fact that they entertained the most diverse religious sentiments.

Griesinger's life and labors at Winneuthal cannot be better pictured than they are in the words of his honored teacher, Dr. Zeller :

From the first to the last day of his sojourn here, his was an earnest, happy, humane and scientific life.

Owing to the manifold and fundamental differences in our spiritual views, we were frequently led into the keenest controversies; but these were conducted in such a manner as never for a moment to disturb our most friendly relations. With the largest measure of spiritual capacity, and the quickest appreciation, which enabled him to grasp and overcome all obstacles and to work out his conceptions with the greatest rapidity, he threw himself with youthful manliness, earnestness and fire into this new department of science. He sought no pleasure aside from the extension of his scientific knowledge and experience, and especially he loved psychiatrie and the ward duties of the house. At no time did he allow his attention to be drawn from these by any new appearances or movements upon the broad field of natural science, poetry, philosophy, or history. It was a luxury to have him for an assistant; a word, a thought, was at any time sufficient to draw from him, in the shortest period of time, a written treatise in entire conformity to the special intention; so that I have frequently said to him in jest, that were I Prince Metternich, I should have him for my cabinet secretary. When he separated from here, he said, though he seldom gave utterance to his feelings, that his sojourn here had been the happiest period of his life. I was disappointed that I was unable to retain him. He continued devoted and true to us, and we to him.

After Griesinger had labored two years (1840, 1841) in Winneuthal, he repaired in 1842 to Paris—and on his return resided for a time in Vienna, and then settled in Stuttgart as a practicing physician. Here he commenced to write his Manual, "The Pathology and Therapeutics of Mental Diseases," the materials of which he had previously prepared in Winneuthal, and it was printed in 1845. In the meantime, he had been invited by Wunderlick, then Lecturer at Tubingen, to become his clinical assistant; he accepted the call, and continued three years in this position.

In 1847 he was named professor extraordinary, and the year 1849 brought him a call to Kiel, as ordinary professor of the hospital clinic, and member of the College of Health. In Kiel he only continued from September, 1849, to the beginning of May in the following year. During this time his marriage took place.

About the 1st of May, 1850, he resigned his place at Kiel, to accept a call to Cairo, as president of the council of health, director of the school of medicine, and body physician to the Viceroy of Egypt, Abbas Pasha.

He continued two years in Cairo, but was not satisfied with his labors, as everything relating to science was on so very imperfect a foundation as to render any special efficiency impossible. He returned in the year 1852 to Wurtemburg, and after his return to Stuttgart, he wrote his treatise on infectious diseases.

In the spring of 1854 he became professor of the clinic at Tuebingen. At the same time he entered into relations with the institution for idiots, at Marienburg, and here gathered the richest experience upon the field of idiocy, which he set forth in the second edition of his book in 1861. After a time, things not being in all respects as he could desire at Tubingen, he determined to remove on the first favorable opportunity, and in the spring of 1860 he went to Zurich. Here his days were delightful, and his labors were crowned with the most happy and satisfactory results. It was indeed to him a most joyous period. He took great interest in his hospital and the number of his pupils; and a call to take part in the oversight of the construction of the new asylum building, gratified the lively interest he ever manifested in psychological pursuits. The building of the institution occupied him during the whole of his sojourn at Zurich. He was a member of the committee of construction, and the work was carried on in entire accordance with his ideas.

Griesinger was twice in England, (1859, 1862,) and remained several months, studying carefully and observing the operations of the medical schools, hospitals and institutions for the insane there, and examining the great libraries. This experience he made useful in the construction of the new hospital at Zurich, for which an appropriation of three millions of francs had been made. At Zurich he was also chairman of the board of health. His interest for psychiatric researches was also shown in the organization of clinical instruction on insanity, which he commenced in the old asylum in 1863, and conducted regularly during the winter session.

In the fall of 1864, he received and accepted a call to the professorship of psychiatry and nervous diseases in the Royal Charity Hospital, in Berlin, and in March, 1865, entered upon the duties of the position. He left Zurich with great reluctance, having endeared himself to his many friends and colleagues by his valuable labors and the beauty of his character. He loved the grand scenery of Switzerland, its mountains and valleys, and especially its freedom. But in Berlin the field of his labors was to be broader, and he sacrificed his personal inclinations to enter upon it. At Berlin he was a member of the college of health, and as such accomplished much good, for he was a prominent, experienced and practical hygienist. He developed a system of regulations respecting cholera, and later, (1866,) he was chosen president of the cholera congress at Weimer. He also founded the Berlin psychological society, and established his new journal, "*Archiv fur Psychiatrie und Nervenkrankheiten.*"

During his sojourn in Berlin he paid visits to France, England, Holland, Belgium and Italy. He went to France and England to effect a closer union of members of his specialty, and to bring about a meeting of them.

He corresponded with physicians in America,* and it was a cherished scheme with him to bring about a national congress of psychiatrists, to assemble in Switzerland; but alas! the Swiss that so loved Griesinger were never again to behold the clear eye or hear the loved voice of their dear master.

His health during the whole period of his sojourn in Berlin had apparently been undisturbed. On the 2d of June, 1868, he was first taken sick at Vienna, whither he had been called on a consultation. A few days after his return, on the 4th of June, he was under the necessity of taking to his bed with symptoms indicative of an attack of perityphlitis. This condition appeared to improve in a short time, and he left his bed, and went out, but was seized with an attack of syncope, and was again obliged to take to his bed, which he was destined never to leave. In the further progress of the disease there appeared a swelling in the right hypochondriac region, the nature of which was at first doubtful; later, fluctuation became apparent, and it was opened by Dr. Rosser, and exit given to a large quantity of pus. After this the healing process seemed to progress favorably for a time, but alas, the wound took an unhealthy appearance. Diphtheritis supervened, and his strength seemed to fail. To complete the measure of his sufferings, there arose, even after the wound had assumed a more healthy appearance, symptoms of paralysis, which Dr. Welms, who attended the patient, recognized as diph-

* In a letter to us bearing date December 7, 1867, he says: "I wish strongly to pursue the progress of science in America, and to entertain scientific relations with your country. I hope to make a journey to America in the autumn of 1868, to make the acquaintance of men, and institutions of mental science. Always dispose of me where you think I can do anything to support you in your endeavors for the psychiatric clinics."

theritic. In the mean time the paralysis became progressive, and finally seized upon all the voluntary muscles, and he became entirely helpless. It was with great difficulty from loss of voice and defective articulation, that he could make himself understood by his wife. Finally the muscles of respiration were seized, and then followed a protracted and frightful condition of impending suffocation, which only gave way a few hours before death. At the height of his paroxysm of suffocation, one of his friends standing by his bed, asked him if he suffered intensely: he replied as courageously and unsubdued as ever, "It is perhaps to close the scene."

A post mortem examination of the abdominal cavity revealed the fact that the abscess in the right hypochondriac region was the result of perforation of the appendix vermiciformis.

Griesinger's death as well as his life was courageous, poetic, beautiful. He continued at his post working manfully to the end. Even while suffering the most intense bodily agony, he was constantly dictating to his faithful wife, who had to be both nurse and secretary. He said to the young physicians who gathered mournfully about him, "I have done my duty, go ye and do likewise!" As his life was poetical, so also was his death; and in his last hours he gave proof of what he so often confirmed by his actions during life, that inspiration is not a piece of merchandise to be kept stored away for many years. A few hours before his death he called his beloved wife to his bedside, and repeated, with tongue half paralyzed by diphtheria, the words of Heine:

"One post is vacant—the wounds gape, one falls and another advances, yet I fall invincible and my weapon is not broken—only my heart breaks."

Two hours before his death he longed for the time to

come, and said, "two hours yet." Soon after this he was heard to whisper his last words: "My spirit begins to wander."

Griesinger cherished poetry and felt its inspiration, and frequently sought by it to sweeten the prose of every-day life. After a hard day's work, and when he was about to steal from the hours that should be devoted to rest, and betake himself to some new and wearisome task, he would repeat the words of the great poet which were ever in his mouth. "The traces of my earthly days will not be lost in the infinite." No, the seed of Griesinger's earthly life will not be "lost in the infinite," but will spring up in other spirits and bear abundant fruit.

Venerated man! In distant lands other eyes than those that have "seen your face in the flesh," moistened, and other hearts than those of your countrymen were made sorrowful at the tidings of your early departure.

After this brief biographical sketch of Professor Griesinger, let us endeavor to unfold to our readers something of the character of his mind, and the means by which he was enabled to accomplish what he did; not that we are in a position, or have the disposition or space to follow him, only so far as may be necessary to furnish an index to the moral and intellectual affluence of the man; and to this end we shall make free use of such materials as are furnished us by those who knew him well.

Griesinger's first independent studies, says Dr. Westphal, commenced at a time when German medicine was just beginning to emancipate itself from philosophy, and was striving to take a legitimate rank with other sciences. It was Schonlein who bore the new banner aloft, and Griesinger followed with enthusiasm. Schonlein had already made the way of simple, natural observ-

ation plain, and while he was at the bedside engaged in practical treatment he was far from being speculative; but away from the bedside and in the professor's chair he appeared quite another person, and was full of theories which bore the impress of natural philosophy, and of the truth of which we must believe he felt a conviction.

When we mention Schonlein in this place, it is to show that Griesinger was influenced by him, as a young man, in his studies; but this was only to a certain extent. Schonlein laid little stress upon the influence of bodily diseases upon mental disturbances, while Griesinger, on the contrary, was fully conscious that only by the methods pursued in the investigation of other natural sciences, could any real advance be made, and continued to act in this belief to the end. (See his observations on the diagnostics of diseases of the brain. *Archiv fur Heilkunde* 1862.) Still he possessed a strong aphoristic and speculative element which was hid under the new drapery of the so-called physiological medicine.

Always full of spirit and activity, he had as early as 1843 sought to trace analogies between certain simple physiological and mental phenomena, and brought forward as examples to illustrate his views, the analogy of exertion of the will with the motor nervous muscular action; showing that they belonged in the same category; that the conditions of fatigue and paralysis had their mental correspondents in weakness and loss of will; that tonic convulsion had its mental correspondent in persistent inflexibility of purpose; convulsive movements, in undirected impulses, desires, inordinate actions, &c., &c. To these speculative views he attached great importance, while we, on the contrary, must say, that merely a similarity and scarcely an

analogy can be said to exist, and that the genuine advancement of knowledge cannot be obtained by pursuing this path. Indeed, we have now become rather distrustful of such constant speculative views, inasmuch as we perceive the danger of their leading to what has merely the appearance of knowledge. These speculative, philosophical elements took a firm hold of all his subsequent labors, and were made useful even when he had, at the same time, to deal with well-established matters of fact: they were inflexible. Before everything else, it was this quality which enabled him so readily to recognize and establish general principles from a series of separately observed facts, and which put him in a position so to arrange the facts as, from a general point of view, to elicit the spirit of them as a whole. So from his very nature he was formed for and drawn to authorship, and to the dedication of his powers to the preparation of his text-book; and we must here remark that his brilliant qualities are indeed the most apparent in this work.

It is easily explicable, in view of such gifts, how Griesinger, as a young man, and after a relatively short period of observation, (only two years,) was in a position to write a text-book on psychiatrie, with which all earlier works are not even in a remote degree comparable, and which was for the first time a development of genuine scientific materials. Although the psychological basis on which the statements are essentially formed, cannot now be regarded as fully fixed and authoritative, it must, on the other hand, be admitted that for unity of design, and for the setting forth of facts now well established, it has not been surpassed, and the last edition (1861) is undoubtedly the best text-book on the subject extant, and its translation into both French and English furnishes ample proof of this.

The same also may be said of his work on infectious diseases, one of the best books on the subject in Germany.

The path of pathological experiment which belongs to modern times, he had never trod; and little did it seem to be his disposition or natural inclination to conduct the details of any special research to the solution of some distinct problem. His whole scientific individuality had something of a contemplative character. He felt the irresistible charm of natural research, and was able to turn the whole power of thought upon the elucidation of whatever came before him. He seized upon all new facts with enthusiasm, but they were made subservient to the establishment of great general principles; this done, they lost their charm, and were forced into the back ground. As the result of this disposition he was inclined in the beginning of each session, to set forth in an introductory lecture such general views and changes as the development of new facts had in the mean time brought about. He had also, at least in his clinics for psychiatrie and nervous diseases, a decided predilection to depart from the general description of disease and turn to the elucidation of special cases. On the whole, we may remark, that his genius was not in all respects such as is congenial with the pursuit of the pure natural sciences, but partook largely of the philosophical and historical. He was often heard to express the wish to his wife and intimate friends, that after a few years he might be allowed to retire to some secluded spot, and spend his life in philosophical rest and contemplation.

To the gifts mentioned above there also belonged a marked poetic element. His discourses, always beautiful, and in form complete, had in them something elevating.

The same element was also manifested in his conversation, and at such times the expression of his countenance was striking, uncommon, and not easily described. Not unfrequently his conceptions took a poetic form; and he seldom took leave of the natural scenery of Switzerland at the end of his holiday journeys, without giving expression to his feelings and his longings after the glories of nature in a poem. These poetic elements, taken in connection with the above gifts, lead us at once to trace a family likeness between him and the great Swabian poet, his countryman.

There is no department of medicine to which the above described mental disposition was more thoroughly adapted than that to which, interruptedly, it is true, but ever with a strong preference, he devoted himself, and of which, in the midst of other occupations, he never lost sight—"The peaceful shore by which the stream of psychical phenomena flowed." *Psychiatria*, about to take its place as a branch of medicine, poor, often beggarly poor in facts, necessarily demanded the *a priori* method of reasoning; and this being the case no criticism was justifiable so long as known facts were certified by the laws which properly governed them. This last was ever done to the full extent by Griesinger. Blame attaches only to those who, in collecting new facts failed to separate them from theories, and so embarrassed all free observation: such was not the case with Griesinger, at least in a prominent sense. Rich indeed, was he in theories, which he disseminated with a free hand, although *psychiatria* was then barren of facts: and if his theories were not always sustained by facts of later observation, they were still not fruitless, inasmuch as they provoked a more thorough investigation. In making the first scientific arrangement of existing facts, and in enriching *psychiatria* with his own

numberless and prolific ideas, he laid the foundation for its future development.

Not content with rendering his science mere literary service, we henceforward find him laboring to make the young generation familiar with this new department. For more than ten years, he added to the ordinary duties of his calling, as clinical physician, the delivery of a series of lectures on psychiatria, and as often as opportunity offered, selected cases of psychical disease for subjects of clinical demonstration. Later, in Zürich, he manifested equal zeal in sustaining a psychiatric clinic during the winter. That his efforts to form and perfect a system of psychiatric instruction were crowned with success, is evident from the fact that soon after his removal to Berlin, a clinic for nervous diseases was established in accordance with his expressed desire, and became at last an integral element of his psychiatric teaching. It had indeed been repeatedly declared by those who understood the matter, and by others, who merely repeated without understanding, that the so-called psychiatric diseases formed only a portion of the diseases of the nervous system.

By no one, however, was the connection between the two departments of nervous disease so deeply comprehended, so vigorously emphasized and so clearly demonstrated as by Griesinger, and he was the first, not only to establish this connection firmly, but to make it evident to the world. What others talked of he accomplished, and the beneficent results of his action to science and to medical practice are incalculable.

If the study of scientific psychiatria was greatly advanced by this innovation, he introduced another, of no less importance to the practical, forensical problems of psychiatria. At his suggestion, the government provided that in cases of doubtful mental condition of per-

sons charged with or convicted of crime, the courts should not be called upon to pronounce "yes" or "no" on the question of sanity or insanity, till the patient had been subjected to sufficient observation in an asylum to enable the physicians to form a correct opinion as to the mental condition of the accused. We need not speak of the judiciousness, indeed, necessity of this measure, says Dr. Westphal, as the accused persons were placed for purposes of examination in the insane department of the "Charité;" and a great advantage was secured in thus providing material for instruction in the important branch of juridical psychiatry.

The labor which it cost Griesinger to perfect his reflections and embody them in fixed opinions is not fully appreciated; he applied himself to his work with the youthful freshness and activity which characterized all his actions. While many of his opposers were inactive, and failed to appreciate the importance of a personal observation of things and their relations, he spared no pains to arrive at opinions founded on individual experience; and for this purpose he made repeated visits to England, Belgium and France; entered into personal intercourse with all prominent physicians for the insane; and corresponded with the physicians of America on subjects connected with insanity. No new experience escaped him. This theorizer, as many thought proper to call him, differed in his conception of the value of experience from those who were never weary of exalting their own practical capabilities. Perhaps none of his achievements were so entirely founded on experience as his plans of Reform. He saw that in lunatic asylums there were many individuals who were capable of a life of less restraint than that afforded by the institution, and to whom, in fact, hospital life was positively deleterious. This conviction, to the truth of which we

can all testify, took possession of his heart and brain; and his heart, especially, was an inexhaustible fountain of inspiration to him, in devising a more liberal method for the care of certain classes of insane.

In making his plans for what he called clinical and city asylums, he was led to the belief that a general diffusion of psychiatric knowledge could be reached only through clinical instruction; and that, indirectly, a decrease of the number of incurables might be secured by the original, proper understanding and treatment of new patients. It was therefore necessary that these asylums should assume, so far as possible, the character of common hospitals, into which curable patients, or such as were suffering from acute but transitory attacks could be quickly admitted, and without any troublesome formalities.

True it is, that much of what Griesinger proposed was not new, and had been often suggested, but to make this a matter of reproach is the grossest folly. What good thought is altogether new! In the world much depends on when, where, how and by whom a thing is said or done. That a man is able to say the right word, at the right time, in the right way, and from a place whence it can be heard, distinguishes him, makes him great, though a hundred others may have said the same thing before him. Such was the case with Griesinger. How truly he foresaw, is now conspicuously evident in the fresh impulse, the new direction given to all questions relating to the care of the insane—an impulse and a direction hitherto unknown. The opposition which he encountered will soon be forgotten, and his opponents will be foremost in their assurances of having always, in truth, shared his opinions. He was himself always conscious of impending difficulties, and used laughingly to say, that a cause unable to survive such attacks

must be bad indeed. He, who was reviled as a theorizer and an idealist, accomplished more in practical matters during the short period of his activity than any of his predecessors: he founded a clinic for nervous diseases, and established its connection with the psychiatric clinic. He introduced into the Supreme Court the practice of a personal examination of persons of doubtful mental condition, and finally—in opposition to earlier and more isolated endeavors—he formed coherent, practical plans for the reform of Insane Asylums and methods of treatment; plans which death alone prevented him from carrying into execution.

This man, whom practitioners, as they called themselves in contrast with him, scarcely recognized as a professional associate, had that within him which lifted him far above them, and which finds its illustration in the wonderful results effected by his words—a mighty enthusiasm for his conceptions and an iron determination to embody and vitalize them, which death only could defeat. During his long, painful sickness, but one thing occupied him; the welfare of the insane. In those last days he frequently gave expression to the thought that he died true to his convictions: this he wished to be known. We repeat the words of the poet, which his dying lips recited:

A post is vacant! a wide gap remaining—
One falls, the line its onward course still takes—
I fall, unconquered yet, my arms retaining
Bright and unbroken—'Tis my heart that breaks.

We present the following beautiful analysis of the character of Prof. Griesinger, by Prof. M. Lazarus, taken from the "Archiv. fur Psychiatrie."

We have applauded Griesinger's aspirations in the department of science; we must not forget his executive power: we must com-

pare his accomplishment with his endeavor, not for the sake of acknowledging his merit, but for the purpose of appreciating the valuable results of his work.

Your familiarity with his psychiatric achievements I presuppose; but I cannot forbear glancing at the history of his *psychiatria* and at its comparative position. My views of the matter do not altogether harmonize with those of the previous speaker, and especially do I consider that it was not the comprehensive, philosophic mind of Griesinger which prevented him from making further advancement in the special domain of facts. Rather state the case in this way: were the abstract question put to us to-day, What position does *psychiatria* hold as a science in regard to the ideal of such a science which a comparison with other branches of medicine would lead us to form? We should say unconditionally, it occupies a very low place. This I say absolutely when the question is put wholly in the abstract. The matter assumes another aspect when taken in the concrete. Already has the subject been elevated through Griesinger's text-book, which, up to the present time ranks pre-eminent, and has been selected from a mass of cotemporaneous and later works as superior, both for practitioners and university teachers. The classifications arranged by him are still considered the most authentic in practical, as in forensic medicine.

The essential point, however, lies not in the relative value of his psychiatric work, but in its having effected a significant advance over all previous attainment.

And this advance, so far from being made in spite of his philosophical tendency, was to a great degree the result of it, and eminently so, in that he for the first time introduced a theory of psychiatric instruction into medicine. A theory at once fruitful and plastic, and which, although the certain issue of philosophy, was profitable for medicine and for practical psychology.

And what have unphilosophical physicians accomplished? What could they accomplish? Consider only the state of opinion in regard to intellectual operations which prevailed at the time when Herbart and his school were abandoned. Dominant among physicians and laity was the familiar theory which maintains that man knows nothing whatever of psychical processes, that he may not speak of psychological laws, and that an analysis of intellectual operations as apprehended by the simple, popular consciousness, is impossible. Bewildered by a contemplation of the varied forms of intellectual life, man collects under a common name much that is

homogeneous, or appears to be so, and then declares that, in order to be able to do all this, the human being is endowed with certain powers. Hence exist understanding, reason and an appetitive faculty. But if sickness intervene, what then? First of all arises the great question of the *mind's* capability of being diseased, and is met by such answers as these—the understanding was strong and is become weak, it was normal and is abnormal, &c.

Gentlemen! no practical knowledge can be associated with such ideas, for they make any analysis of what we have before us impossible. If we do not first understand single processes and acknowledge simple laws, a true comprehension of a complexity of phenomena is unattainable. Such a theory of psychical processes was merely adduced even by Herbart, and Griesinger, in the preface to his work, makes immediate mention of having introduced it. Without such a theory, it was actually possible for the empiric Heinroth to attribute all disease to sin and misery. Moreover, what hindered the empirics from discovering another and a better theory than that of the philosopher? What hinders them now, and where are their achievements?

But at that time medical matters were in no way so disposed as to render philosophy a hindrance and a stumbling block. Did not Schonlein belong to philosophy, and truly to philosophy of the best sort, natural philosophy? Did he not begin as a natural philosopher, and quickly come to the point of seeking to establish the true method of obtaining knowledge, namely, the contemplative? The people were in truth hindered by popular imposition, by such methods of observation as were taught by Rademacher. Rademacherism, crude, common, unscientific empiricism.

That psychiatria has not attained the character of a science, is owing to an outward, superficial way of regarding the individual patient, and even of classifying him. Then with all analytical knowledge there must be a beginning, and this is of course impossible without categories of positive data as a means of observation. Truly, progress is a very slow affair. Indeed, a pure psychological theory would affect nothing for psychiatria. So long as we consider the nerves by themselves, and the soul by itself, so long as in our discussions we place thought and intellect on one side and the body and its organs on the other, regarding their union as a sort of riddle; so long as we do not fix our attention on the continually perfecting process between them and the enlightenment it brings, so long can neither psychology nor neurology accomplish anything for psychiatria.

What we need and hope for—and who ventures to speak of more than mere hope in connection with psychiatria—are the investigations of psychosomatics. Before psychology, were these investigations as a general thing imaginable? or to substitute a more important question; have not these studies rested on psychological theories? Was not the chief work of Fechner immediately attached to Herbart's theory?

Moreover, Griesinger rendered psychiatria a second and very essential service, and one which physicians should be the last to forget, in connecting it with pathological anatomy. Not that this has as yet been very productive of results for the science of disease or for methods of cure, but independently of present results, this study has been, and ever will be indispensable to the development of psychiatria. Who will deny that all physical investigations in connection with psychiatria, especially those relating to its therapeutics, have without exception been as unproductive as a pure philosophical treatment of the subject could ever be? This, however, will hinder no philosopher from considering versatile physical investigation as an indispensable condition of future progress.

And here it is important for us to know how the matter stood at the time when the first edition of Griesinger's work appeared. Conscious of doing a conspicuous thing, he made a proposition in his preface, which we have come to regard as so self evident, that we fail to see in it any special claim to significance or praise. He said that he should make an attempt to bring therapeutics into a much closer relation to pathology than had hitherto been done. Imagine what must have been the condition of therapeutics when the establishment of its closer connection with pathology was spoken of as an experiment. How different the present attitude of theories! Therapeutics without constant reference to pathology, pathology without reference to physiology, that is, the knowledge of morbid and abnormal processes dissociated from those that are normal and healthy, is to us inconceivable. For the treatment of mental diseases we need a physiology of the mind, and this is psychology, which even in the second decade of our century was made to answer the demands of physical science, but was first associated with medicine by Griesinger. We hope for such results here as have been experienced in the department of physiology, (the bodily organism;) originating in the pathological medical interest, the investigation of healthy processes has been constantly attended and benefited by the investigation of diseased processes. Would that psychology also might be widened and deepened through psychiatria.

So thought Griesinger as here, in Berlin, he took hold of this department afresh. It was a laudable act of ethical self-restraint for him to give up his general clinic, and the corresponding branch of teaching, in order that he might work the more energetically in this field. He not only desired to devote himself to the practical side of the subject, in connection with which he had reached new conclusions, but to a system of constant theorizing.

The new report which he established bears witness to the fact that he had reached the point of treating mental diseases as only a part of nervous diseases. Alone in his hands, the idea was not dangerous; but in making it public the necessity of uniting with it an understanding of diseased mental phenomena, should have been everywhere urged. There is intrinsic danger in this principle—the danger of neglecting the psychological side afresh. In this case, however, the knowledge of the mental disease would be as far from exact, and as little productive of favorable results, as if the point of view were purely mental. Above all things, an advantage would be forfeited by which it is high time that we profited. One may treat mental disease as nervous disease, but not alone in that, are psychological processes and laws to be found; medicine has long owed to it psychology to study psychical phenomena in other, and especially in nervous diseases; an old obligation which medicine shows no intention to discharge. Mere physiologists, have so far as I know, greatly profited by those investigations which are known under the name of psychosomatics. If physicians would but learn of the psychologist, they would continually acquire a desire to teach him in turn, and a capacity for doing it. The sick bed is an important post of observation from which the psychologist is excluded, and it therefore devolves upon the physician to make it useful theoretically.

To this end was Griesinger especially inclined and devoted: not only a profound knowledge of psychical phenomena, but a conspicuous interest in them, was peculiar to him. He could be interested to the remotest degree in the detail of the patients' delusions. He had the mind and tendency of a true, and as men say, a born psychologist—others as well as himself, he continually observed, in health and in sickness, in all conditions of mind and body, from every point of view and according to all phenomena.

Just as among physicians for bodily ills, we discriminate those who, themselves often sick, are tender, sympathetic, and able personally to appreciate a variety of conditions in their patients, from those who, strong, robust and never suffering, know but from hear-

say of many symptoms, troubles and perceptions of the sick, and are incapable of imagining themselves in their place or of exercising any intuitive sympathy; so in psychical observations much will depend on the character of the observer—whether we have a cold, coarsely-constituted soul, or a warm, tender, delicately-organized nature.

Griesinger retained unimpaired a vitality of mind and soul, a youthfulness of comprehension and a student's power of receptivity. At the sight of a patient, the desire to discover something new, interesting and remarkable, controlled him to a degree that led him to the verge of error, so strained was his eagerness for instruction; but the first tension relaxed, he invariably saw the truth.

He particularly excelled in the art of listening. We can all of us see him still, as covering his eyes with one hand he listened to the expositions in the Society, justly estimating each opinion, and in *résumé* or reply giving emphatic prominence to the valuable thought of others.

Foreign inquiry was not only accessible to his thought, but he sought it; he knew nothing of unyielding technicality. Thanks to his susceptibility of fresh impression, he ever examined the questions relating to the condition of the insane with renewed zeal. His opinions on that subject did not remain fixed: his first convictions were not his last, and he spoke of each altered conclusion with the greatest frankness.

And here let me mention this: so timely was his prudence that, in introducing the "non restraint" question into the first edition of his text-book, he brought forward the arguments for it, and then, with still greater zeal and energy, he stated all the reasons that had been urged against it, and finally made them his own; nevertheless he closes with this idea: many experiments must be waited for before the question can be decided. If these experiments failed to sustain his theory, seeking as he did every opportunity to make them personal, the way was thus left open for him for adopting opposite opinions.

Gentlemen! we admire consistency when, through an increasing and ever changing knowledge of facts, it abides by enduring principles; we admire it then the more, when it puts itself in the place of absolute truth, and, resisting all egotistical sophistry, creates out of the strength of personal conviction, a power of assimilation, which exceeds the mass of that originally inherent in principles. We admire, I say, consistency; but we reverence that love of truth which, constantly open to inquiry, is ever ready to

recognize any idea which occasional experience and argument may offer as true. To be *consistent* for a good reason is fortunate; to be *inconsistent* for a good reason is meritorious.

This very question in which Griesinger's inconsistency of opinion is so conspicuous, namely, the reform of insane asylums, is become, as you sufficiently know, a subject of immediate contention. In the midst of the fight the champion is fallen. There are men who will not fail to take up his arms. Never yet has a thought, having intrinsic life, been permanently abandoned for lack of supporters and defenders. And the fight will be fought out and the goal reached. For in the province of the mind a law of development has been long recognized, which, transferred to the department of organic nature, creates a result so legitimate and important and which is lauded as a discovery: in mental matters it is no recent conviction that the noblest creations are the result of conflict; only through contending opinions, only through the criticism and strife which they evoke, is advance in knowledge promoted. Arguments are arrayed against each other; and the deepest, the most forcible, the clearest arguments will invariably prevail. Conviction is led against conviction, and the best, the noblest, the most luminous conviction will ever unfurl her banner as victorious truth. Therefore, let the one or the other side be temporarily—why do I say temporally?—let the one or the other side be in the future victorious; the merits of him who has fought with so much earnestness and energy will remain the same; for he has ever battled for the truth, and only through strife is the truth gradually revealed.

The last, the true acknowledgment associating itself with this life, will be that to future eliminated truth may be confided the memory of him whom we are met to-day to celebrate.

But a few months have elapsed since the death of William Griesinger, yet his life and works have received public notice in Prussia, through Hoffman, Westphal and Lazarus; in Saxony, through his devoted friend Wunderlick; in England, through Maudsley and Sibbald; in France, through Morel and Brierre de Boisment; in Italy, through Livi; and in America, through the Editors of the JOURNAL OF INSANITY. Austria has also hastened to pay honor to the memory of this

learned friend of humanity. For this purpose more than three hundred medical students assembled in the audience room of Professor Dr. Skoda, in the General Hospital at Vienna, on the 13th of December, 1868; Professor Billroth took the chair. The Rector Magnificus, Professor Karl Braun, and many professors and doctors were present. An introductory speech was made by the presiding officer, and Dr. J. Mundy delivered a memorial oration. Professor Billroth spoke as follows:

"The commemoration of distinguished men, in speech or writing, is so ancient a custom among all civilized people, that we may well regard it as an essential element of æsthetic culture. To honor the memory of a man who belonged to the narrow circle of our scientific fraternity, is for our faculty a sort of family solemnity.

So let me regard the present occasion, the commemoration of William Griesinger, in which our honored associate, Baron Mundy, has desired me to take a part. In yielding to his request that I should take the initiative to-day, I owe you an apology, inasmuch as psychiatria, the specialty through which Griesinger was best known, is a subject with which I am not familiar. My apology finds best expression in the intimate personal relations which I had the good fortune to sustain towards the deceased.

Easter, 1860, we were both summoned to Zürich, where, for nearly six years, we worked, not only near each other, but I may well say together. Chief among many reasons for making those years memorable, I am proud to count the formation of my friendship with Griesinger, a friendship which lasted to the end of his life.

The faculty in Zürich was oddly composed: three Swiss, Locher, Cloëtta, Horner; two from Frankfort, Frey and Hermann Meyer; one Hollander, Moleschott;

one Hessian, Adolf Fick; one Bavarian, Bernhard Breslau; one from Dessau, Edward Rindfleisch; one Swabian, Griesinger; and myself a Germanized Scandinavian.

Griesinger soon became the soul of the corporation in which there had as yet been no violent dissension. His unsurpassed mental influence, his power of analysis, his clearness of thought, his sense of right, his objectiveness, his rich, well methodized and ever ready experience, made his word so effectual in controversy, that decision quickly followed his speech. This is certainly much to say in a corporation where a varied German nationality was represented by so many young, active men.

How shall I describe the peculiar, deep impression which Griesinger made upon me? I can give you no better idea of it than by assuring you that during the years of our life together, I never came in contact with him without receiving something from him. He was intellectually so rich that he unconsciously endowed all those who understood him. His highest capabilities were devoted to the thoughtful contemplation of nature, to the consideration of the sick person as an object of nature in all its human relations, to the thorough study of every such object, and to the examination of the combination of natural phenomena of the so-called symptoms of disease. It is evident that this method was directly opposed to the modern plan of learning everything by steam, and so making the brain a mere repository of excerpts. Hence arose many of the conflicts in which Griesinger engaged. Whoever suddenly assailed him with twenty questions and expected to receive immediately, clever and convincing answers was greatly deceived. The intensity and conscientiousness of his thought made this impossible. Often in hastily interrupting Griesinger about this or that important

question, I seemed to see written on his features the words that Lessing puts in the mouth of Nathan after his first conversation with Saladin: ‘What will the Sultan have? Truth! truth! and will have it as bare and as bright as if truth were coin! Yes, as if it were weighed as is ancient coin! that might be deficient. Such new coin as only the die makes, as one pays at the counter. One should put truth in his head as he puts gold in a sack.’

Griesinger was conscious in each instance of the limits of our knowledge and skill, yet he never despaired of investigation. His motto to the last was, “Seek and ye shall find: Knock and it shall be opened unto you.”

Investigation is in itself deliverance and salvation, gentlemen, to him who diligently follows it.

To the striking and bold thought of the philosopher, Griesinger united the tender imagination of the poet, and the dream-like sense of a child.

We stood together before the eternal ice fields of Mount Rosa, Mount Blanc and the Bernese Alps, we passed by Titlis, the meadows carpeted with cowslips and gentians, to the Engstlen Alp, and were ferried across in the “light canoe” from Canton Schwyz to Rütli.

I shall ever remember one summer evening in Seelisberg, when we leaned against the railing, and silently gazed into the deep green waters of Lake Lucerne; to the right, over Altdorf, the peaks of St. Gothard glowed in the evening light, to the left the Mythen cast its deep blue shadows over Brunnen and Schwyz!

The stillness of the forest was around us—wonderful enchantment! In such hours soul communes with soul—a hundred years cannot efface their remembrance.

What Griesinger as a full and complete human being was to his friends I know full well, although no language is adequate to express my thoughts.

What Griesinger accomplished as a man in the Department of Science to which he devoted the greater part of his life, can be told you by Dr. J. Mundy, who shared his aims and was his true friend."

The oration of Baron Mundy, is made up largely of the facts and incidents in the life of Professor Griesinger, already given above by Dr. Westphal. We cannot forbear, however, quoting in conclusion his beautiful exordium :

"The learned clinical instructor of the Berlin Charity, and the excellent man, whose early death science and humanity mourn, shall himself indicate the manner in which I may be permitted to speak of his life and works. On the occasion of a memorial oration on Schonlein, in Zürich, in 1864, he spoke with me of the spirit in which such subjects should be treated.

He was of the opinion that 'above all things, while seeking to delineate the works of a man, we should neither speak hypercritically or praise with undue ostentation; but should be satisfied if, after a simple picture of the life and labors of the deceased, the young auditors should leave the hall with the impression that one should not live merely for acquirement, but for the fame of the same, and, he concluded, this fame must be a means by which his work can be advanced.'

Indeed, gentlemen, as Griesinger uttered this we were reminded of that Roman who began a memorial discourse on a dear one departed with these remarkable words: 'Assuredly a great and good man is not made glorious by empty praise, or by incense rising to the skies, but by an imitation of his life and a continuation of his labors.'"

LIST OF THE PUBLISHED WRITINGS OF PROFESSOR GRIESINGER.

1838.—Inaugural Dissertation on Diphtheria.

1842.—Herr Ringéis and the School of Natural History. Upon Pain and Hyperæmia. Heine. Physio-pathological Studies, from the life of father and son, (a Memorial of J. G. Heine, the orthopædist.) Answer to Dr. Eisenmann.

1843.—On Psychical Reflex Action, with a glance at the conditions of psychical diseases. Observations on the Modern Developments of General Pathology.

1844.—New Contributions to the Physiology and Pathology of the Brain.

1845.—Upon Serofula. The Pathology and Therapeutics of Psychical Diseases, (1st edition.)

1846.—On the Anatomy of Acute Rheumatism, with especial reference to the writings of Gottschalk. Setting forth of Rheumatic Disease on an Anatomical Basis. Upon Acephalocysts of the Heart.

1848.—On the Revision of the Modern *Materia Medica*.

1852.—The Anatomy of Bilious Typhoid, (a dissertation before the Imperial Academy of Sciences of Vienna.)

1853.—Clinical and Anatomical Observations on the Diseases of Egypt, (with two continuations of the above.)

1854.—Continuation of Clinical and Anatomical Observation on the Diseases of Egypt.

1859.—Studies upon Diabetes.

1860.—Diagnostic Observations on Diseases of the Brain. The Protracted Form of Rheumatic Brain Affection. Supplement on Diabetes. Resumé of Seventy-two Cases of Pneumonia. On the Clinical History of an Enlargement of the Liver by Multifarious Echinococci.

1861.—Upon Spotted Fever.

1862.—Continuation of Observations upon Diseases of the Brain. Cystercerci, and their Diagnosis. On the Doctrine of Disease of the Brain from Internal Otitis. Aneurism of the Basilar Artery. Tetanus, with peculiar condition of the urine, together with observations upon the disease. Prof. Skoda on the Causes of Typhus.

1863.—Introductory to the Opening of the Psychiatrical Clinic at Zurich, 1863-4, (translated into English by Dr. Mundy.)

1864.—Adenoid of the Liver. Abstracts from Clinics at Zurich, (in archives for physiology.) Infectious Diseases, (1st and 2d editions,) in Virchow's Manual of Special Pathology and Therapeutics, (translated into French, English and Italian.) The Pathology and Therapeutics of Psychical diseases, (2d edition, translated into English, French, and Italian.) An Academic Discourse in Commemoration of Schonlein.

1865.—Upon Muscular Hypertrophy.

1866.—Introductory to the Opening of the Clinic for Nervous and Mental Diseases in the Charity Hospital, Berlin, (translated in England by Sibbald, and in France, by Falret.)

1867.—Introductory to the Opening of the Psychiatrical Clinic at Berlin, May 2, 1867. Archives for *Psychiatria* and Nervous Diseases, (translated by Eds. AMERICAN JOURNAL OF INSANITY, April, 1868.) Transactions of the Cholera Conference in Weimar, (of which Griesinger was President,) with scattering observations.

1868.—In Archives for *Psychiatria*, &c. Upon Institutions for the Insane, and their Further Development in Germany. The Non-restraint System. Methods of Research into Cranial Contents. Upon an Epileptiform Condition. On Modern Psychiatrical Science in Germany, a plea against the brochure. Progress and Retrogression of Dr. Lahr, (separate.) Opinion on the Mental Condition of Count Gustave Chorinsky, indicted for homicide by poisoning, in Munich. Upon an Obscure Psychopathic Condition. Introductory to the Opening of the Psychiatrical Clinic in Berlin, May 1, 1868.

BIBLIOGRAPHICAL.

I. *Reports of English Asylums. Report of the Committee of Visitors of the Lunatic Asylum for the City and County of Bristol to the Town Council, January 1, 1868.*

Dr. Henry Oxley Stephens, Superintendent of this Institution, reports on the books Dec. 31, 1866, men 110, women 106—total 216: admitted in 1867, 86, of which 12 were re-admissions: discharged recovered 35, relieved 8, removed 10: died 23: remaining Dec. 31, 1867, 226. Of the admissions 48 were chronic cases. It is notable that the "Visiting Commissioners in Lunacy," in their Report remark: "A large proportion of the cases are mentally in a very unfavorable state as regards the probability of their ultimate cure, but they require for their treatment all the appliances which an asylum can afford; and we *saw few, if any*, whose removal to a Workhouse would be desirable."

The Town Council is asked for an appropriation of £3,000 to enlarge the accommodation. The Visiting Commissioners recommended more frequent "entertainments," and a piano for the Hall; though the Superintendent prefers to this the formation of a "Band" from among the attendants and more intelligent patients.

Some criticism was expressed as to giving the patients a soup or stew on Fridays, which, though good in quality, was objected to by patients, (better favored than Oliver Twist, perhaps:) "In the summer and autumn months baked rice-pudding, followed by a ration of bread and cheese is substituted for soup." The statistical tables are very full, in which we observe that intemperance, mental anxiety and paralysis figure

as largely among causes of insanity as they do here, but "puerperal" and vicious life rather less.

II. Twentieth Annual Report of the Somerset County Pauper Lunatic Asylum for 1867.

Dr. R. Boyd, the Physician of this Institution, reports December 31, 1866, patients 487: admitted in 1867, 167: discharged recovered 79, relieved 12: not improved 2: died 48: remaining January 1, 1868—males 223, females 209—513. All but 16 per cent. are chronic cases; 26 per cent. idiots and epileptics. Dr. Boyd says he could furnish 50 patients and the union workhouses about 170 more for a new idiot asylum, if one should be built, which is a desideratum.

Dr. Boyd reviews the history of 20 years since the Asylum was established. He proposes increasing the accommodations of the whole Institution to the number of 800. He recommends provision to be made for the reception of a class not to be reckoned among paupers strictly, but yet without means sufficient to support them at private asylums. The five counties of Cornwall, Devon, Dorset, Somerset and Wilts, report 1,158 idiots in a population of nearly two millions, though in union workhouses, many adults are counted idiots who are simply chronic cases of dementia.

Dr. Boyd also makes some valuable suggestions on the subject of medical relief for the sick poor, as a preventive of insanity. He says:

Insanity is often the result of bodily illness, and the disorders of the mind would be mitigated, and the pressure on county asylums lessened, if proper nursing, and medical necessaries were liberally provided at every Union Workhouse. A more liberal provision for the poor in sickness would diminish the number of candidates for the asylum. It should always be remembered that the sick ward of the union is the proper basis of all cure for the sick poor. The question may now be considered in what light is insanity to be

regarded, whether altogether as a specialty, or as it more frequently appears to be, merely a symptom of physical disease. The most experienced medical men are of the latter opinion. Our knowledge of the nervous system is still incomplete. Upwards of 900 cases that have died in this institution have been examined by me, besides a considerable number previously in the St. Marylebone infirmary; no special changes were detected to account for the disorder of the mind, but it was generally associated with bodily disease. Insanity may therefore be considered as more sympathetic, or as it is commonly termed functional, than organic, according to my experience. General paralysis of the insane, is, however, an exception, as I shall point out in the second part.

The microscope would probably have enabled Dr. Boyd to detect "special changes" to "account for the disorder of the mind." He very justly remarks in regard to the indigent: "The proper and most beneficial succor to the working classes would be to improve their dwellings." This important subject is attracting attention in this country as well as in Europe.

A large share of the insane poor are still in work-houses. We transcribe the following note as containing some valuable statistics on this point:

The return which has been issued by the Poor Law Board giving an account of pauperism in England on 1st July, 1867, shows that at that date there were 41,513 insane persons in receipt of relief from the poor rates, of whom as many 11,103 were in the work-houses. Four years previously, on 1st July, 1863, the total was only 36,212; the number in both instances being a little below the truth in consequence of the absence of returns from parishes not under Boards of Guardians, containing nearly one per cent. of the population. The increase, more than 14 per cent. in four years, seems large; but many who were formerly regarded as ordinary paupers, and some probably as recently as four years since, are now classed as insane, and the improved treatment of the insane prolongs life. The distribution of the insane is a subject of considerable interest. The return shows the largest proportion of insane paupers in the metropolis, their numbers on the 1st July last amounting to 24 per 10,000 of population as enumerated at the

census of 1861 (or 21.81 on the estimated population of July, 1867;) the south-midland and south-eastern divisions of England come next, with more than 23 insane paupers per 10,000 of census population; then the eastern, south-western, and west-midland divisions, with more than 22 per 10,000; next, the north-midland, with more than 20 per 10,000, and the Welsh with almost exactly 20. The north presents very different figures. In the north-western division (Lancashire and Cheshire) the ratio is only 17.54 per 10,000, in Yorkshire only 15.96, and in the northern division only 16.15. But that part of the kingdom has a small proportion of its population of all classes upon the rates. The number of paupers of all classes receiving relief on the 1st of July last was as follows:—In the metropolis, 4.50 per cent. of the population as enumerated at the census in 1861; in the south-midland division, 5.79 per cent.; south-eastern, 5.19; eastern, 6.50; south-western, 5.91; west-midland, 4.32; north-midland, 4.17; Welsh 6.12; north-western, 3.29; Yorkshire, 3.38; northern, 4.26. The insane paupers of England on the 1st of July last were one in 22 of the whole number of paupers. It is hardly necessary to say that the insane in England, or of any class in England, are not one in 22. A very large proportion of the insane paupers are paupers because they are insane, being dragged down by this misfortune into a class to which they did not belong. The Poor Law Board, giving an account of the insane paupers as a body, speak of their pauperism as "ascrivable to insanity." In fact, the insane paupers of England who on the 1st of July last were one to 516 of the estimated population of England, may be taken to comprise the great majority of all the insane in the kingdom. The Lunacy Commissioners report 49,082 insane persons in England on the 1st of January last, which would be one in 434 of the estimated population. There are private cases that do not come under their cognizance; an estimate allowing for these would be confirmed by the report on the Irish census of 1861, which, including the result of an inquiry on this particular, shows the whole number of insane in Ireland one in 411 of the population. It will be understood that in the term "insane" the idiot as well as the lunatic is included.

At the annual meeting in 1866 of the Medico-psychological Association, which includes almost all the superintendents of asylums in the United Kingdom, it was unanimously resolved, "that in the opinion of the meeting, the treatment of the insane now in workhouses is not satisfactory, and it is desirable to have the

care of all the insane poor of the counties transferred to the Visitors and superintendents of county asylums."

In the way of amusements the Institution has a band and a portable theatre.

In the close of his Report, Dr. Boyd tenders his resignation, after a service of twenty years to the County, under which this Asylum has developed to the efficiency and success of a first-class Institution.

Dr. Boyd appends to this Report a second part, which in itself may be regarded as a treatise on the subject of General Paralysis, or what is now more technically styled *Paresis*. Dr. Boyd is justly recognized as authority in this department, and his observations are well worthy of reference. We commend to the profession his views of the importance of *post-mortem* examinations expressed in the following extract:

As a rule a post mortem examination is invariably made here, and the state of the spinal cord observed. The cause of death is frequently obscure, and without a post mortem examination cannot be certified with accuracy; if it be done carefully, as a rule no objection is ever made. In every public institution a post mortem examination should be imperative, as it is the only way in which the diagnosis of the disease can be established or corrected, and it is by such means our knowledge of disease is to be extended. The public equally with the medical profession are interested. All workhouse infirmaries, for instance, should be conducted in such a way as to be made useful as places of medical education for the study of disease and morbid appearances; this would no doubt be the case if workhouse infirmaries were not under the sole control of elected boards of Guardians, who have power to close them against pupils.

The medical profession have been forced to provide other and less adequate means for the instruction of their pupils to those which workhouse infirmaries so abundantly afford, by the establishment of hospitals, which only partially provide for the wants of the poor, for the most part being confined to a few medical and surgical wards for adults; children are not received, or aged or insane persons, so that the pupils have not the advantage of witnessing the

treatment of such cases, which form so large and important a share of their attention when in practice, and which workhouse infirmaries would so amply afford.

We also give the following remarks on general paralysis as connected with the results of the examinations which he has himself made:

Post mortem examinations have confirmed the observations in the previous report, that fatal cases of *general paralysis or palsy*, were found to be accompanied by and probably dependent on softening of the spinal marrow, and frequently combined with inflammation of the membranes and fluid in the ventricles of the brain. The attention of pathologists is called to this important subject, as in no English writer has any allusion to it been found. The report goes on to state; although so little seems to be known respecting the pathological anatomy of general paralysis which has only of late years been recognised as a distinct, frequent, and most fatal disease of the insane, it results from my observation that there is no affection of the nervous centres occurring in insanity which presents so well marked and constant morbid changes; and these are seated in the spinal cord, although the brain or membranes are commonly implicated. These changes are chiefly, inflammation of the cord itself or its membranes, (meningo-myelitis,) thickening and preternatural adhesions of the arachnoid; softening, induration, enlargement or atrophy of the spinal cord itself. In the brain, thickening of the arachnoid membrane, with fluid at the base of the skull, and in the ventricles and spinal canal, with a roughness from crystals, as if minute particles of sand were sprinkled on the floor of the 4th, and sometimes to a slighter extent also in lateral ventricles. It may further be observed that general paralysis or palsy sometimes precedes the mental derangement. This would occur where the spinal cord first became diseased, and disease afterwards attacked the brain; such cases originating in the spinal cord, are most likely to be checked if detected early. The application of warmth to the spine caused manifestation of pain here in some patients when percussion failed to do so. General paralysis is, however, most frequently preceded by some form or other of insanity; and it is commonly in such cases the certain forerunner of a more or less speedy and fatal termination; unless a more precise knowledge of its true nature should lead us to a corresponding improvement in its medical treatment.

We observe that in 1867 there were no less than 91 cases of epilepsy in this Institution, of which 46 were men and 45 women. This is remarkably different from anything we have known of the Institution with which this journal is connected, the proportion of female epileptics here being very small. Dr. Boyd has tabulated monthly in each case the *number of fits*, by day and by night. The 46 men had 4,094 fits by day and 2,431 by night. The 45 women had 4,387 by day and 1,810 by night.

We append the following remarks on the treatment of epilepsy:

The bromide of potass has been given to a larger number of cases. The girl mentioned in the last report to whom this drug was given has not had a return of the epileptic seizures; when the slightest indication of her attacks occurs she resumes the use of it. A man employed in the establishment had a very severe epileptic seizure in the spring, which rendered him unconscious for the time; he had the same drug in doses of from 20 to 30 grains and has had no return of the attack since. None of the confirmed cases in the house to whom it was given have recovered, but in most the fits have been less severe and less frequent, and from the experience in this place, it is the drug of all others upon which greatest reliance may be placed. Tincture of "Sumbul" has in a few instances afforded a very considerable relief. Many other drugs have been tried as stated in former reports in cases of epilepsy without any permanent benefit, as "Digitalis," "Belladonna," "Cotyledon umbilicus" artemisia vulgaris, or mug wort, all of which were supposed to have specific effects; in some cases aperients were given with temporary benefit, as sulphate and carbonate of magnesia combined; also tonics, as cod-liver oil, cinchona and nitric acid, and various preparations of iron, strychnine and phosphates.

III. *Forty-Ninth Annual Report of the Visitors of the County Lunatic Asylum, Stafford, for the year ending December 31, 1867.*

Dr. Bower, of this Institution, reports December 31, 1866, patients 496: admitted in 1867, 248, discharged

recovered 99: relieved 5: transferred to to Auxiliary Asylum at Burntwood 21: died 84: remaining December 31, 1867, 535. There are also at Burntwood 223 patients, making a total of 758. There are 1,165 registered pauper lunatics in the County of Stafford.

Dr. Bower complains of the number of idiots sent to the Asylum. In fact, there seems to be too little idea of making separate provision for this class, which in many counties is counted in with the insane. Dr. Bower properly urges separate buildings, or else the opening of wards in connection with the workhouses for them.

IV. Tenth Annual Report of the Committee of Visitors of the Cambridgeshire, Isle of Ely and Borough of Cambridge Pauper Lunatic Asylum for the year ending December 31, 1867.

Dr. G. Mackenzie Bacon, Superintendent of this Asylum, reports the number of patients at the close of the year 1866 as 279: admitted during the year 75, of which 14 were re-admissions: discharged recovered 42, relieved 8: died 31: remaining January 1, 1868, 273—men 128, women 145.

About 90 of the patients labor on the farm, and 27 "Ipswich patients" have been removed to their own domicile, to the great relief of the overcrowded wards. In 1860 there were 286 lunatics and idiots belonging to the county; now there are 405. Cambridgeshire is chiefly agricultural, and stands pretty high in its rate of pauperism, there being a very observable connection between the proportions of poverty and insanity in any given district. Thus, in Wiltshire, 1 in every 12 of the population is a pauper, and 1 in 327 insane; while in Westmoreland and Cumberland the pauperism is 1 in 28 and 24 respectively, and the insanity 1 in 517 and 543. The average in England appears to be about 1 in 400 and the average of accommodation in public asylums is 58 per cent. The workhouses have 24 per cent.

private asylums $2\frac{1}{2}$ per cent. and private families $15\frac{1}{2}$ per cent. Dr. Bacon states that this asylum provides room for 75 per cent. of the lunatics of the county.

From the steward's accounts we see the weekly charge for maintenance of county patients was 10s. 7d.: for patients out of the county 13s., and for private patients (of which but 1 is reported) 14s. From the "Lady Day Quarter" of 1866 to the "Christmas Quarter" of 1867, flour had advanced from 35s. a sack to 48s.; but beef had fallen from 8s. per stone to 6s. 5d., and mutton from 9s. to 7s. 6d.

The Committee of Visitors in their report, give an account of the sad necessity of having been obliged to remove from his office, Dr. Lawrence, who had been the efficient Superintendent of this Asylum from September, 1860, to October, 1867. The cause was mental incapacity arising from the incipient symptoms of general paralysis. Dr. Lawrence was retired on a pension of £50 a year, and Dr. Bacon, his former Assistant, appointed in his place. The Visitors properly suggest that there should be a permanent Assistant Medical Officer, as the labor is too great for only one physician, which seems to be all that is allowed most of these English County Asylums. The case of Dr. Lawrence is a manifest comment on this system.

V. *Sixth Annual Report of the Cumberland and Westmoreland Lunatic Asylum for 1867.*

Dr. T. S. Clouston, Medical Superintendent, reports at beginning of the year 1867, 278 patients: admitted 97—men 59, women 38: discharged recovered 29, not improved 1: died 31: remaining Jan. 1, 1868, 314—men 179, women 135.

Dr. Clouston makes some suggestive remarks in connection with the fact he gives that there has been a

steady and rapid increase in the number of admissions. This being a young institution, the vicinity is becoming gradually better acquainted with its character and objects, and the consequence is that a much larger proportion of patients are now brought in their acute stage. In relation to the cause of the apparent general increase of insanity, he makes the following rather noticeable observations:

To determine the cause of the apparent increase in such a disease as insanity, which comprises in reality several diseases, it is important to take some of its forms which are so definite in their characters or causes that they can neither be mistaken nor confounded with any other, and of such character that they almost all require Asylum treatment, and see if those are increasing. I have taken the numbers of each of the following forms of insanity that have been admitted each year, viz.: congenital insanity, dating from birth; epileptic insanity, its cause being uniformly epileptic fits; general paralysis, a form of insanity perfectly distinct from all others, and not in any way shading off into any other form; and lastly, puerperal insanity, dependent on childbirth or lactation alone; and I find that the number of cases suffering from those kinds of mental aberration are remarkably uniform during the five years. The numbers are 25, 16, 15, 27, 25, beginning in 1863, that is in 1863, 1866, and 1867, when the Asylum received nearly all the cases from the two Counties, the numbers were almost identically the same, and in 1864 and 1865, when a large number of cases were sent to other Asylums, they were considerably less. This is a most striking fact when we take into account that the total number of admissions, including all kinds of insanity, rose gradually from 47 to 97 in four years. If any one form of insanity were taken, the inference would be open to the objection that the numbers were too few to found any conclusion on them, but by taking the only four absolutely fixed and definite forms of insanity, and three of those almost always requiring Asylum treatment, the conclusion is made almost certain that insanity is not on the increase in the two Counties, but that the numbers annually sent here have hitherto increased from merely temporary causes, the chief of these being the increased wish to send most cases here early, the increased desire among a socially higher class to have their relatives sent here, and the tendency which at present prevails to send old persons laboring under temporary excitement with dotage here.

The committee of visitors speak in high terms of Dr. Clouston's management, and have appointed a medical assistant for him, Dr. Campbell.

VI. *The Seventieth Report of the Friends' Retreat, near York,*
1866.

The Seventy-second Report of the same, 1868.

This is an institution under the auspices of the religious society of Friends.

Dr. J. Kitching reports in the latter of the two reports given above, that the number of patients at midsummer, 1867, was 136: admitted during the year 17: discharged recovered 8: improved 1: not improved 1: died 7: remaining at midsummer, 1868, 136—men 52, women 84.

The gross income of the year was £9,556, all of it from patients but £116. The Institution is now out of debt, having made sufficient profit since 1853, to pay the cost of building a wing for the female wards, and several expensive alterations.

Dr. Kitching pays considerable attention to the "development of the *social* life of the insane," and lays a good deal of stress upon attention to individual peculiarities, as distinguished from what he calls the "mass treatment," or classification in groups. His institution, architecturally, doubtless, possesses many facilities for individualizing the treatment; especially as his number of patients is comparatively small, and a large proportion of them females: for whom, also, he has an unusual number of attendants and servants: but of course such arrangements would be impracticable in large public institutions, without swelling the expense beyond reasonable limits. We extract at some length the observations which he made on this subject in his previous report for 1866, embracing his criticisms upon the plan

pursued in Belgium, premising only that the classes he excepts as suitable for the Cottage System are such as we deem the proper ones to be cared for at their own homes:

The amount of personal liberty with which insane persons may be entrusted without detriment to themselves or annoyance to the sane community, is always a question of nice discrimination, and often of anxious care. To the patients themselves, it is one of almost vital importance. Too much liberty, by which delusional or crazy tendencies may be indulged unchecked, till they acquire dangerous proportions or incurable fixedness, is an obvious evil. On the other hand, if caution is carried to timidity, and seclusion to excess, the minds of the patients will deteriorate, the mental powers will become inert, and the blighting haze of dementia will too surely envelope them.

No better illustration can be afforded of the judicious management of lunatics, no stronger proof can be given that a wise humanity has presided over their treatment in the earlier stages of the malady, than the degree in which they retain some power of rational enjoyment, or some faculty of peaceful industry in the long course of the chronic stage. To rescue such a faculty from the long past wreck of reason, is the glory of the treatment; to retain it, is to experience the green old age of insanity.

Closely connected with the question of the personal liberty and the social enjoyment of the lunatic patient, is a subject which has engaged considerable attention of late under the name of the Cottage System of treating lunatics. In the well-known colony of Gheel, in Belgium, this plan has been extensively practiced, and the ideas which underlie the experiment are based upon much that is sound and valuable. They may be enumerated as follows: 1. The view of placing the patient in sane society. 2. That of training him to some industrial pursuit, and giving him an abundance of fresh air. 3. That of allowing him more personal liberty, and a nearer approximation to the ordinary modes of social life than he could have in an asylum. Notwithstanding the plausibility of these views, the plan as carried out at Gheel is acknowledged by some of the best judges to have failed in producing the full benefits anticipated from it.

Its failure was inevitable, as plans founded on wrong principles must sooner or later always be. Whilst seeking to avoid the evils

of large establishments, it ran into the opposite extreme of individual treatment—a mode of treatment the least adapted to many forms of lunacy, even in their chronic stage. The lunatic cannot, in an isolated condition, be supplied with all that he requires on account of the expense of providing it. The treatment must therefore be an associate treatment, except in the case of wealthy persons. Unless the sane persons amongst whom the lunatic is cast, in such an arrangement as that at Gheel, be adapted by the possession of sound judgment and humane motives for rightly influencing the patients, it is evident they must commit errors of the gravest import to the welfare of the latter. The society of sane persons is doubtless a desideratum in the treatment of insane individuals; but to have a beneficial influence in promoting their recovery, the associates of the insane must possess qualities which the rustics of a village cannot indiscriminately claim. It is often feared that the mutual association of insane persons must have a reciprocally injurious influence, and this is often stated as a drawback to sending patients to lunatic establishments. There are cases in which the action of one insane patient upon another is pernicious, but the influence of a sane mind without discrimination and judgment may be much more so. To this I believe all concerned in the management of the insane will readily assent.

The industrial training which forms a prominent feature in the Gheel plan, can be quite as well carried on in a large lunatic asylum, and in the latter is much less liable to be monotonous and influenced by sordid motives than in the cottage of the artisan. The third idea, that of less restraint and of exemption from the crowd-force and routine of a large establishment, is only of weight as regards a certain proportion of the insane. In most acute, and all violent cases either of mania or melancholia, the associate action of an establishment, and the moral influence of its power, are of the highest value; means of treatment are also possessed which cannot exist in private dwellings. These views, however, are fully consistent with the belief, that for a portion of the insane, the regulations of a large asylum, the pressure of numbers, and the adaptations for the severer forms of mental disease to which all the inmates must in some degree be subject, are not necessary and are not beneficial; but that, on the contrary, they oppress the mind and form conditions if not unfavourable to recovery, at least productive of much unprofitable discomfort. For these the possession of more personal liberty, the enjoyment of more social advantages and a more home-like mode of life, are conditions, for depriving them of which no

pursued in Belgium, premising only that the classes he excepts as suitable for the Cottage System are such as we deem the proper ones to be cared for at their own homes:

The amount of personal liberty with which insane persons may be entrusted without detriment to themselves or annoyance to the sane community, is always a question of nice discrimination, and often of anxious care. To the patients themselves, it is one of almost vital importance. Too much liberty, by which delusional or crazy tendencies may be indulged unchecked, till they acquire dangerous proportions or incurable fixedness, is an obvious evil. On the other hand, if caution is carried to timidity, and seclusion to excess, the minds of the patients will deteriorate, the mental powers will become inert, and the blighting haze of dementia will too surely envelope them.

No better illustration can be afforded of the judicious management of lunatics, no stronger proof can be given that a wise humanity has presided over their treatment in the earlier stages of the malady, than the degree in which they retain some power of rational enjoyment, or some faculty of peaceful industry in the long course of the chronic stage. To rescue such a faculty from the long past wreck of reason, is the glory of the treatment; to retain it, is to experience the green old age of insanity.

Closely connected with the question of the personal liberty and the social enjoyment of the lunatic patient, is a subject which has engaged considerable attention of late under the name of the Cottage System of treating lunatics. In the well-known colony of Gheel, in Belgium, this plan has been extensively practiced, and the ideas which underlie the experiment are based upon much that is sound and valuable. They may be enumerated as follows: 1. The view of placing the patient in sane society. 2. That of training him to some industrial pursuit, and giving him an abundance of fresh air. 3. That of allowing him more personal liberty, and a nearer approximation to the ordinary modes of social life than he could have in an asylum. Notwithstanding the plausibility of these views, the plan as carried out at Gheel is acknowledged by some of the best judges to have failed in producing the full benefits anticipated from it.

Its failure was inevitable, as plans founded on wrong principles must sooner or later always be. Whilst seeking to avoid the evils

of large establishments, it ran into the opposite extreme of individual treatment—a mode of treatment the least adapted to many forms of lunacy, even in their chronic stage. The lunatic cannot, in an isolated condition, be supplied with all that he requires on account of the expense of providing it. The treatment must therefore be an associate treatment, except in the case of wealthy persons. Unless the sane persons amongst whom the lunatic is cast, in such an arrangement as that at Gheel, be adapted by the possession of sound judgment and humane motives for rightly influencing the patients, it is evident they must commit errors of the gravest import to the welfare of the latter. The society of sane persons is doubtless a desideratum in the treatment of insane individuals; but to have a beneficial influence in promoting their recovery, the associates of the insane must possess qualities which the rustics of a village cannot indiscriminately claim. It is often feared that the mutual association of insane persons must have a reciprocally injurious influence, and this is often stated as a drawback to sending patients to lunatic establishments. There are cases in which the action of one insane patient upon another is pernicious, but the influence of a sane mind without discrimination and judgment may be much more so. To this I believe all concerned in the management of the insane will readily assent.

The industrial training which forms a prominent feature in the Gheel plan, can be quite as well carried on in a large lunatic asylum, and in the later is much less liable to be monotonous and influenced by sordid motives than in the cottage of the artisan. The third idea, that of less restraint and of exemption from the crowd-force and routine of a large establishment, is only of weight as regards a certain proportion of the insane. In most acute, and all violent cases either of mania or melancholia, the associate action of an establishment, and the moral influence of its power, are of the highest value; means of treatment are also possessed which cannot exist in private dwellings. These views, however, are fully consistent with the belief, that for a portion of the insane, the regulations of a large asylum, the pressure of numbers, and the adaptations for the severer forms of mental disease to which all the inmates must in some degree be subject, are not necessary and are not beneficial; but that, on the contrary, they oppress the mind and form conditions if not unfavourable to recovery, at least productive of much unprofitable discomfort. For these the possession of more personal liberty, the enjoyment of more social advantages and a more home-like mode of life, are conditions, for depriving them of which no

moral or psychological reason exists. There are three classes of patients to whom I think this statement applies.

First—Those patients whose mental impairment consists in the milder forms of melancholia, of moral, or of emotional insanity, which while they deprive them of the faculty of entire self-government and unfit them for the responsibilities and, more or less, for the pursuits of life, neither destroy the reasoning powers, deaden the sensibilities, nor introduce any element of danger into the outer or inner life.

Second—Those chronic cases in which some harmless, fixed delusion, the residuum of a more pervading active form of insanity, co-exists with much power of general self-regulation and an intelligent appreciation of the concerns and interests of ordinary life. Decided intellectual tastes, and love for literary or scientific pursuits, often accompany this stage of insanity, and are cultivated with pleasure and success.

Third—Those patients who are liable to occasional or periodical attacks of acute disorder, but who have long intervals of partial sanity. In some of these cases, the lucid intervals are apparently complete; but to the skilled observer, there is an arrest of convalescence at a sufficient distance from complete sanity, to deter the physician from subjecting the patient, during any portion of the interval, to the difficulty and hazard of self-government and entire freedom from surveillance and control. The writer has for many years entertained the opinion that for patients affected, like those above specified, with the lighter forms of insanity, who retain a large measure of mental and moral capacity, a position in which they might have medical advice and skilled surveillance whilst enjoying a larger range of personal liberty and social intercourse than is possible with the all-embracing arrangements and uniformity inevitable in a large establishment, would not only diminish the sufferings attendant upon insanity in the aggregate, but form an advance in its treatment which claims to be tried at the earliest period that it can be carried into effect.

VII. IRELAND. *Annual Report of the Waterford Asylum for the Insane Poor for the District of the County and City of Waterford, for year ending December 31, 1867.*

Dr. Frederick MacCabe, the Resident Physician of this Institution, reports the number of patients January 1, 1867, as 154: received during the year 43: discharged

recovered 23, improved 7, not improved 1: died 10: remaining December 31, 156.

Physicians in this country may like to see the general classification as to form of Insanity. It is as follows: Mania, 50; Melancholia 12; Dementia 53: Monomania 28; Imbecility 3; Idiocy 2: Epileptics 8. The proportion "probably curable" is 41. One-eighth of the whole number is over the age of 60.

At the date of this report, two new wings to the main building were in process of erection, and a third addition had been provided for, besides a building to be devoted to divine worship. These improvements will increase the accommodation of the Asylum to 200 beds. The average cost of maintenance per head was £24 7s. 9d.

VIII. WALES. *Third Annual Report of the Glamorgan County Lunatic Asylum, Bridgend, for the year 1867.*

The Medical Superintendent, Dr. D. Yellowlees, reports on January 1867, 278 patients: admitted during the year 98: discharged recovered 29: not recovered 4: died 20: remaining December 31, 323. The mortality, it will be seen, was but 6½ per cent. In the three years this Asylum has been in operation, the deaths have been 34 among the men, and but 5 among the women. Dr. Y. states that patients are now usually brought at an earlier period of the malady than formerly and that "the preliminary probation at the workhouse is less frequently insisted on."

He also bears the usual testimony as to the value of occupation, and subordinately, of amusements. He says:

Nothing is so conducive to health, both of body and mind, as suitable occupation; and nothing tends more to promote contentment and recovery. Great pains are therefore taken to find employment of some kind for all who are capable of it.

The ordinary domestic work of the wards, of course, furnishes occupation for a large number on both sides of the house. The

women are also employed in sewing and knitting, or in the laundry and kitchen. The men work in the garden and fields, or with the tradesmen, as tailors, masons, and blacksmiths. Their only remuneration is luncheon in the forenoon, and an extra allowance of snuff, tea, or tobacco. The numbers employed are very large, averaging nearly three-fourths of the entire number of patients. The economic value of their work is therefore great, while the gain to themselves in health and happiness is greater far.

Amusements are much less valuable as a means of treatment than occupation; but they are very necessary to relieve the monotony and routine of asylum life. All kinds of games are therefore encouraged, and the weekly ball continues to be enjoyed as much as ever.

The value of *early* treatment is also shown by the fact that out of 54 admissions, being cases of less than six months' standing, 41 were regarded as curable, and 16 of the 41 had been already discharged: while out of 44 cases of longer duration, only 7 were regarded as curable, and but *one* had been discharged.

Dr. Y. adds to his report a "Medical Appendix," by way of recording his observations in the matter of treatment, and drawing general principles.

A large portion of this paper we think the specialty will thank us for transferring to our pages:

It is a frequent but I believe an unjust reproach cast upon the medical officers of asylums, that they forget their character as physicians and degenerate into "mere house-stewards, farmers, or secretaries." This impression arises not unnaturally perhaps from the fact that their Annual Reports contain, except in the case of a very few asylums, very little that is strictly medical. They are reports of county institutions presented to non-professional men, and they therefore refer chiefly to the progress, efficiency, and special circumstances of each institution: it does not appear to be their purpose, and scarcely perhaps their legitimate use, to give details of individual cases nor experiences as to the value of certain drugs.

On the other hand, it is greatly to be regretted that the invaluable medical lessons, which every asylum teaches, should be so

often buried hopelessly and uselessly in its case books. It is also perhaps matter for regret that when these experiences are recorded they should so often be divorced from the asylum where they were gained, and should appear as isolated communications in the pages of a medical journal. The causes and phases of Insanity in each asylum, and consequently to some extent the opinions and experiences of its physician, are materially influenced by the habits, occupations, and general tone of the population from which the patients are derived—an agricultural, a mining, a seafaring, or an artisan population retaining even in insanity something of their distinctive features. It seems to me therefore that these experiences can be best recorded, at least in the first instance, in an occasional Medical Appendix to the Annual Report of the Asylum to which they were made.

The right use of sedative or narcotic drugs is certainly one of the most important practical questions in the treatment of insanity.

The general impression OUTSIDE of asylums too often appears to be that whenever a lunatic becomes troublesome and restless, or is supposed to be dangerous, he must be forcibly restrained, either by a strait waistcoat or by a number of his neighbours, and forthwith drugged by narcotics into quietness or stupor. Even when restraint is not practised, narcotics are held to be indispensable and are used freely and indiscriminately.

It is quite possible even IN asylums to acquire *Narcotics* unconsciously the habit of too readily resorting to *and Sedatives.* sedative or narcotic medicines, when a patient is found or reported to be more excitable or more troublesome than usual. It saves a great deal of trouble to the attendants, and of annoyance to the other patients; it procures quietness, of a certain kind, in the Wards; it is much the easier way, and is perhaps more gratifying to a false medical pride, than to prescribe such ordinary remedies as castor oil, a country walk, some hard work, or some mental occupation.

While fully acknowledging the great value of sedatives and narcotics in many cases, I believe the habitual indiscriminate use of this class of remedies to be needless and baneful. It is certain that they often fail to produce the desired effects, and that it is frequently necessary to try in succession many different kind of sedatives, each of them affording only very temporary benefits; further than this, I have convinced myself by suddenly withdrawing the sedative, and suddenly resuming it again after an interval, that the satisfactory results it was supposed to be producing were

often more apparent than real, or were due to some other cause than the action of the drug. I recommend this perfectly legitimate experiment to any whose faith in sedatives is unshaken.

It cannot be questioned that when these drugs are not necessary, they must be to some extent injurious by lessening the appetite, impairing digestion, restraining secretion, and producing constipation. I believe they are frequently injurious in a more serious way—by prolonging or confirming the mental disorder, and that not only *indirectly* by lowering the general health, but also perhaps *directly* by their sedative effects on the brain.

I am satisfied that I have seen cases where their administration was injurious, and where recovery was retarded by their use. These have been chiefly cases of acute mania, accompanied by great excitement, occurring in patients under 25 years of age. Although the remedy served its purpose in moderating excitement, and did not appear to affect the general health, yet a period of prolonged modified excitement followed, and convalescence was tardy and unsatisfactory, as if the hyper-activity of the brain had been unwisely or prematurely checked.

A somewhat similar condition occasionally occurs without the administration of drugs; every now and again cases are seen of which one can predict that the patient must be worse ere he is better, and in which an attack of excitement would be a welcome and hopeful sign.

In the class of cases to which I refer, it seemed as if these mysterious and inscrutable brain-cells—of which we think so much and know so little—were surcharged with a morbid activity which must work itself off somehow, or were in a state of morbid tension which must find relief by undue rapidity of action, and as if the sedative had checked or retarded the only method by which this tension could be relieved.

Of course there are cases where this hyper-activity manifests itself so fiercely and so dangerously that it must be modified if possible, but in cases of acute mania occurring in early life I believe that narcotic and sedative medicines are apt to do more harm than good, and that they should generally be withheld if the patient be at all manageable without them.

It is no reproach to the physician thus to await the natural elimination of disease, while guarding and assisting the patient safely through it; the real reproach would be thoughtlessly or needlessly to interfere.

The right use of stimulants is another very important question.

The popular impression is that a lunatic must be "kept low," and friends often err in this respect with the best intentions, for assuredly the first principle in the treatment of mental disorder is to establish the bodily health, and to maintain it in as perfect a condition as possible. So true is this that it frequently comprises the whole of the direct physical *Stimulants.* treatment, and the mind recovers as the bodily health improves. This is especially true of some forms of melancholia, of neglected puerperal cases, and of insanity from over lactation or any similar exhausting cause.

It is in these cases too that the value of stimulants—with or without sedatives—is often strikingly seen. They are of great service in calming restlessness, relieving depression, and producing sleep, and they can be given freely in the dietary with marked benefit and without inducing any excitement. They are also of great value in maniacal excitement when tending to exhaustion, or when occurring in a weakly patient.

If the general health can be maintained at a high standard without stimulants, I think they should not be habitually used by the insane, or only very sparingly; but if the physical condition begins to fail, they should be promptly and freely given; it is important to observe the earliest signs of failing health, for it is much easier to maintain the healthy standard than to regain it when it has once been lost. As a prop for a case which threatens to fail, nothing seems to answer so well as the best kind of porter.

As a general rule, whenever the physical condition really requires stimulants, the brain will bear them without injury.

This is true even of general paresis, in which disease stimulants are so universally condemned; the form in which the stimulant has long been regularly given to these cases here is a glass of whisky in a basin of arrowroot about 9 P. M.; this is found to answer remarkably well. Stimulants should always be given to the insane *with* food.

The doctor shows an amusing deference to the "great principle of Non-Restraint" in his apology for using "gloves" with some destructive patients, rather than the padded room, or hot baths and wet sheets, or especially the doses of digitalis and opium so much in vogue in the English Asylums. We think his course only does credit to his medical judgment in spite of

popular prejudice. He is quite right, in the view of all really scientific men, when he lays down the axiom, that Non-Restraint, as well as Restraint, "is a good thing *only when, and just because* it is the best thing *for the patient.*"

Annual Report of the Waterford Asylum for the Insane Poor for the District of the County and City of Waterford, for the year ending Dec. 31, 1868.

The resident Medical Superintendent, Dr. Frederick McCabe, reports to the Governors and Directors, patients in asylum Dec. 31, 1867, as 156: admitted since 65: discharged recovered 32, improved 4, unimproved 6: died 12: remaining Dec. 31, 1868, 167—men 81, women 86. He mentions the remarkable fact that in 1835 when the Institution was commenced with 100 beds, the population of the district was 177,054, but now with the accommodation doubled (200 beds) the population is less by over 19,000 than in 1835. Yet it appears that there are 120 lunatics, idiots, and epileptics at large in the Waterford district exclusive of those in the asylum and in poorhouses. In filling up the increased accommodation however, preference will be given to recent cases. It would seem that poorhouses in Ireland must be better managed than in this country, as Dr. McCabe has no hesitation in sending his chronic cases to them. He says that in the County and Borough Asylums and other registered institutions of England and Wales, there are 33,213 patients, and of these only 3,384 or about 10 per cent. are deemed curable. The classification of the patients in the asylum during the last year is as follows: mania 33: melancholia 18: dementia 83; monomania 17: imbecility 5: idiocy 2: complicated with epilepsy 9: convalescent 18: curable 32: probably hopeless 135.

In the matter of expenditure, it is found that each patient costs £24 11s. 7½d.

IX. SCOTLAND. *Twenty-eighth Annual Report of the Crichton Royal Institution and Southern Counties' Asylum, Dumfries, for the year 1867.*

Dr. James Gilchrist is the Medical Superintendent of both these Institutions. The former is for private patients, the latter for both private and public.

The Crichton Royal Institution had at the close of the year 123 patients, the Southern Counties' Asylum 304.

The statistics of both combined are as follows: Number of patients November 11, 1866, 411: admitted 118: discharged recovered 41, relieved 25, not improved 1—incurable 9: died 35: remaining November 11, 1867, 427. The applications were 189 against 118 admissions. Of the admissions 78 were single, 30 married and 10 widowed. About half were pauper.

The following table may be of interest, as also the analysis of the residents as to health. It is taken from the report on the Crichton Institution:

Employed industrially, men 10, women 9; employed for amusement, men 12, women 9. Taking exercise—under superintendence—in airing court, men 4, women 4; do. in grounds, men 63, women 27; do. beyond walls, men 42, women 22. Taking exercise on parole—in grounds, men 10, women 5; beyond walls, men 3, women 3. Dining in association, men 57, women 26. Confined to house by medical order, men 7, women 9; do. from caprice, women 1. Confined to bed from disease or debility, men 1, women 7. Special dresses, with special fastenings, women 5; do. with locked boots, women 5; do. with quilted blankets, men 1, women 6. In seclusion in bed-room, women 1; do. in seclusion room, women 3. Sleeping on stretchers, women 1. Raised by night attendant, men 7, women 6.

Health.—An analysis of the residents gives the following results as to general health.

Forty-three are apparently unimpaired in bodily health, namely, ten females and thirty-three males.

Impaired.—Thirty-nine; twenty-one males and eighteen females.

Diseased.—Forty-one; nineteen males and twenty-two females.

Moribund.—None.

Medical Treatment.—There are under special medical treatment for bodily diseases, fifty-two, namely, thirty-three males and nineteen females.

For mental ailments, twenty-two; eleven of each sex. In all, seventy-four.

Under *Special Medical Diet* for bodily ailments—thirty. Seventeen males, and thirteen females.

For Mental Ailments.—Seven males and ten females. In all, forty-seven.

Thirty-two are helpless. One is paralytic. Two are epileptics. Eight are suicidal. Three are self-injurers. Sixteen are of dirty habits. Twenty-eight are of dangerous and destructive habits. Seventeen have offensive or improper habits. Twenty-four are noisy.

This analysis will give some idea of the work and worry involved in the management of an asylum.

The health classification of the Counties' Asylum, with its 82 private patients and 222 pauper, is as follows:

As to Health.—Sixty-eight give indications of being perfectly healthy, two hundred and three are considered as laboring under impaired health, forty are diseased, and five are regarded as moribund, twenty-two are epileptics, four are paralytics. Thirty-five are under special care for wet and dirty habits, twenty-seven for dangerous or destructive habits, twenty-six for improper or immoral habits, and sixteen for suicidal propensities. There are under special medical treatment, for mental ailments, twenty-six; for bodily ailments, twenty-eight.

During the last year new buildings have been erected for infirmary accommodation, "Special Galleries" for private patients at an additional charge, who "do not mingle with the other inmates except on public occasions," and for other purposes, such as bath-rooms, &c.

X. *Forty-eighth Annual Report of the Directors of the Dundee Royal Asylum for Lunatics, June 15, 1868.* Dundee.

This is a chartered Institution. Dr. James Roice, the Medical Superintendent, reports the number of patients

in asylum June 15, 1867, as 182: admitted since 61: discharged recovered 24: not recovered 12: died 14: absent on probation 1: remaining June 15, 1868, 191. Eight of the cases discharged not recovered, were removed to the lunatic wards of poor-houses. Dr. Roice refers to the difficulty of providing for cases apparently quiet on removing them from the asylum, as many are often brought back in a state of maniacal excitement. He also testifies to his experience of the good effects of amusements and literary entertainments.

The directors mention three legacies to this asylum during the past year, one of £100, another of £200, and a third of £2,000.

ENGLISH DIETARY SYSTEM IN COUNTY ASY-LUMS.

There is one branch of asylum management which appears to receive more careful attention than is common among us; we mean the "Dietary" System, and we have therefore thought it might be a matter of some interest to give a few specimens of the "Diet-tables" appended to some of these English reports.

At the Bristol County Asylum, the breakfast is the same every day in the week, viz.: 8oz. bread for men and 6oz. bread for women: $\frac{1}{2}$ oz. butter, and one pint coffee for each.

For dinner, on Sundays and Wednesdays, the men have 4oz. corned beef, the women 3oz.: the men 16oz. vegetables, the women 12oz.—this also on Mondays: and *every day* to each one-half pint of beer. On Mondays the men have 8oz. roast meat, the women the same: on Tuesdays and Fridays, soup or "stew," and 4oz. bread to both: on Thursdays, meat pudding with boiled potatoes, 16oz. to men and 12 to women: on Saturdays,

currant or raisin pudding with sweet sauce, 12oz. to men and 8oz. to women.

For tea, 8oz. bread to men, 6oz. to women, with $\frac{1}{2}$ oz. butter and one pint tea to each every day in the week.

At the *Cumberland and Westmoreland Asylum*, breakfast consists of 8oz. bread to men only on Sundays: to women 6oz. every day: pint of oatmeal porridge and milk to men every day but Sunday: pint of coffee and $\frac{1}{2}$ oz. butter to men on Sundays, to women every day.

For dinner, on Sundays, meat pie, 10oz. to men, 9 to women: bread every day but Sunday and Tuesday, 3oz. to men, 2 to women, except on Saturday, when the ration is 7oz. to men and 5 to women: on Mondays and Thursdays, "cooked meat free from bone," 5oz. to men, 4 to women: on Tuesdays, "dumpling," 16oz. to men, 13 to women: on Fridays, "Irish stew," 22oz. and 18oz: on Sundays, Mondays and Thursdays, cooked vegetables, 12oz. and 9oz.: on Wednesdays, "potato-pot," 22oz to 18: on Saturdays, 1½ pints broth to each: and on every day but Saturday a pint of milk to men and $\frac{3}{4}$ of a pint to women.

For supper, 8oz. bread to men, 6oz. to women, 1 pint tea and $\frac{1}{2}$ oz. butter every day in the week, except that on Tuesdays and Fridays cheese takes the place of butter. Working patients have an extra ration at each meal of 3oz. bread and an ounce of cheese.

We subjoin the recipes given for some of the above mentioned articles:

PORRIDGE—Six ounces of oatmeal to each pint. **COFFEE**—For 100 persons, 20 oz. coffee, 10 oz. chicory, 4 lbs. sugar, and 3 gallons of milk. **DUMPLING**—For men, each 9 ounces flour, 1 ounce currants and raisins, one-sixth of an ounce of sugar, and 2 ounces dripping. For women, each 7 ounces flour, 1 ounce currants and raisins, one-sixth of an ounce of sugar, and 2 ounces dripping. **MEAT PIE**—For men, each 6 ounces of uncooked meat free from bone, 3 ounces of flour, and 1 ounce dripping. For women, each 5

ounces of uncooked meat free from bone, 3 ounces of flour, 1 ounce of dripping, and seasoned to taste. **IRISH STEW**—For 100 persons 32 lbs. of uncooked meat free from bone, 6 stones of peeled potatoes, with a suitable dilution of water and pepper and salt to suit taste. **POTATO-POT**—For 100 persons, same as Irish Stew. **BROTH**—For 100 persons, 28 lbs. meat (necks, houghs, &c.) including bone, 10 lbs. barley, liquor from stewed bones, thickened with bread crusts and vegetables, and seasoned to taste. **TEA**—For 100 persons, 1 lb. tea, 4 lbs. sugar, and 2 gallons of milk.

The Stafford County Asylum has the following: For breakfast, 1 pint cocoa with milk and sugar, every day to both sexes: 8oz. bread without butter to men, and 6oz. with butter to women daily.

For dinner the men have 6oz. bread and $\frac{3}{4}$ pint beer daily; 6oz. cooked meat with potatoes on Sundays, Wednesdays, and Fridays; soup and rice pudding—10 oz.—on Mondays and Thursdays, and 14oz. meat pie on Tuesdays and Saturdays, on which days the bread ration is reduced one-half. The women have the same on the same days, an ounce or two less in quantity, the ration of beer being $\frac{1}{2}$ pint.

For supper, the men have 8oz. bread, 2oz. cheese, and $\frac{3}{4}$ pint beer, daily: the women 6oz. bread, $\frac{1}{2}$ oz. butter, and 1 pint tea, daily.

Extras in case of illness or debility.

This gives 30 ounces meat cooked and free from bone consumed by each male patient weekly, and 24oz. for each female. The following recipes are given:

To make Soup for 100 Patients.—The liquor in which the meat of the previous day has been boiled, $12\frac{1}{2}$ pounds of meat, consisting of legs and shins of beef, $1\frac{1}{2}$ pounds of rice, 3 pounds of onions, 3 pounds of leeks, 6 ounces of salt, 2 ounces of pepper, $3\frac{1}{2}$ quarts of peas, with herbs, &c., consisting of carrots, turnips, cabbage, celery, parsley, and parsnips, according to the season, and sufficient water to make 100 pints.

To make Cocoa for 200 Patients.—9 pounds and 6 ounces of cocoa, 6 pounds and 4 ounces of sugar, 9 quarts of milk, and sufficient water to make 200 pints.

To make Coffee for 200 Patients.— $3\frac{1}{2}$ pounds of coffee, $6\frac{1}{4}$ pounds of sugar, 9 quarts of milk, and sufficient water to make 200 pints.

To make Tea for 200 Patients.—1 pound and 9 ounces of tea, $6\frac{1}{4}$ pounds of sugar, 9 quarts of milk, and sufficient water to make 200 pints.

The following is the "dietary scale" reported in the Waterford Asylum for 1868.

BREAKFAST.—Oatmeal, 8 ozs.; new milk, $\frac{1}{2}$ quart.

DINNER.—Sunday, Tuesday, and Thursday:—Beef, 8 ozs. in quart of soup; and bread—males, 10 ozs.; females, 7 ozs. Monday, Wednesday, Friday, and Saturday:—New milk, $\frac{1}{2}$ quart; and bread—males, 10 ozs.; females, 7 ozs.

SUPPER.—Cocoa, 1 pint; and bread—males 8 ozs.; females 7 ozs. Working patients get 8 ozs. meat in pint of soup, or, if preferred, 6 ozs. additional bread, on days of milk, for dinner.

S U M M A R Y.

A MEDICO-LEGAL CASE OF INJURY TO THE NERVOUS SYSTEM.—Early in February last I was called in consultation by Dr. Slight, of Brewer street, to a foreign tailor, A. K.—, aged fifty, who had been knocked down three weeks previously by a van. He had received some scalp wounds at the back of the head, and bruises about the body, apparently from the horses' hoofs; and was said to have been stunned for a few minutes. I found him in bed, complaining of pain about the left side of the head, and speaking in a peculiarly slow and labored manner. He had a quick pulse, and his head was hot. I was informed that he had been almost constantly drowsy, requiring to be roused before he could reply to questions. He volunteered the information that objects frequently appeared double to him. There was no apparent paralysis of face or limbs. His symptoms appeared referable to concussion.

On April 16th and 18th Dr. Slight brought him to my house. His speech had then greatly improved, and he looked much better in general health. He walked lame, however, leaning heavily upon a stick held in the left hand, and dragging the right leg. The

grasp of the right hand appeared very defective. There was no drawing of facial muscles. It seemed that he left his bed a month after the accident; and it was then noticed that his right leg gave way under him, and his right arm was deficient in power. Sensation being tested, we found that he denied feeling compass-points or pinches over the *right* upper and lower extremity. Now, if this were a case of spinal hemiplegia (which the total absence of facial palsy seemed to indicate,) there should have been hyperæsthesia of the paralyzed limbs, with anaesthesia of the opposite side. This discrepancy, coupled with the fact that the patient was then bringing an action for damages against the owners of the van, threw the gravest doubts upon the genuineness of the symptoms. Before proceeding any further, therefore, I resolved to test, by a carefully-contrived experiment, the truth of his assertion that he had lost sensation in the right limbs; and as the means employed were, so far as I know, novel, I will describe them. The lower extremities being bared, I brought near them Stöhrer's induction machine, with its two wires and sponge directors connected with it. I attached, also, to the *box* (not to the working portion) two other wires and sponges; and I gave one of *these* to the patient, directing him to press the sponge on the outside of his left thigh, and the other to Dr. Slight, requesting him to apply it to the same limb on a given signal. Meanwhile, the patient's whole attention being occupied with these pretended operations on his left thigh (the unaffected one,) I applied one of the real sponge directors to the right thigh, and, at the signal, clapped on the other to the same limb; thus directing the most powerful current upon the skin of the paralyzed thigh. At the same moment my assistant applied his sponge. Watching the patient's face we failed to discern in it the slightest expression of consciousness that he was receiving a current, the pain of which is well-nigh insupportable. I then reversed the whole apparatus, applying the electric current to the left thigh. Upon this the patient started with a shriek of unmistakable pain, and nearly fell from his seat. The result of this experiment showed conclusively that, to the electric current at least, there was anaesthesia of the right thigh, and removed at once our doubts of the patient's credibility. Further examination confirmed this view. A thermometer left five minutes in each axille marked 98.1° on the right side, and 97.9° on the left. Careful measurement showed that the right thigh, 6 inches above patella, was $\frac{5}{8}$ inch less than the left; and the right leg, 6 inches below patella, was $\frac{3}{8}$ inch less than the other. The arms were equal. Electro-motility was good everywhere ex-

cept in the thumb muscles of the right hand. Asked to raise his right leg, the foot "dropped" as it was lifted from the ground. I should say here that the fingers of the affected hand were quite flaccid.

On June 13th, measurement showed that the right upper extremity had wasted since last examined. The right arm, 6 inches above olecranon, was $\frac{1}{2}$ inch less than the left; the right forearm, 6 inches above lower end of ulna, $\frac{1}{4}$ inch less than the other. The disparity between the lower extremities had increased. The right thigh, 6 inches above patella, was now $\frac{7}{8}$ inch less than the left; the right leg, 6 inches below patella, $\frac{1}{2}$ inch less than the other. An important change, too, had taken place in the right hand. The middle, ring, and little finger were rigidly contracted upon the palm, and could not, by any exertion of force on my part, be extended. The tendons could be seen and felt projecting and hard in the palm.

On November 20th, the patient walked freely, and there was no dragging of the right leg. The measurement of the thighs and legs was now found to be equal. The wasting of the right upper extremity had increased. The right arm was $\frac{5}{8}$ inch less than the left; the right forearm $\frac{3}{4}$ inch less than the other. The rigidity of the fingers was still more marked than at the last examination. Sensibility was much improved in the right limbs, but was still apparently defective.

At the end of November the case was tried in court, and the plaintiff recovered damages, the testimony of Dr. Slight and myself being to the effect that the plaintiff was permanently disabled in the right hand. The man had been examined, on the part of the defendants, by two eminent surgeons, who were not called, and no opposition was offered to the medical testimony.

The very careful examination to which this patient was subjected, and his gradual progress to recovery (except in the use of certain fingers,) make it evident that he did not pretend his symptoms. The wasting of the limbs and the rigid contraction of the fingers he *could* not simulate. As regards the nature of the nervous lesion, one can only suggest the probability that blood was effused, a part of which became gradually removed by absorption and a part converted into a cyst or haematoma, which encroached upon and destroyed a small portion of nerve-substance. Its exact situation, and whether, as is quite possible, there was more than one lesion, are points which necessarily remain doubtful.—*Thomas Buzzard, M. D., in the London Lancet for March, 1869.*

LOSS OF THE GREATER PART OF THE VAULT OF THE CRANIUM—
RECOVERY.—M. S., aged seventy, unmarried, called on me *at my own house*, on the 10th of last September, to consult me about what she called a “sore head.”

History.—Catamenia have ceased some fifteen or twenty years; enjoyed good health till about ten years ago, when, “owing to trouble,” she got epileptic fits for first time. The fits recurred about once a month.

About three months before the date of the present visit, (sometime in the month of June,) whilst reaching for some article on the chimney-piece, she was seized with a fit and fell into the fire, striking her head, as she fell, against the hob of the grate; the head was burnt very severely, and having applied “many sorts of plasters,” and the sore not healing, she at length came to me.

When she removed a most ingenious front of her own devising and the dressings, I saw, what she called a “sore!”

The integuments covering the top of the head were entirely gone, save a small isolated portion situated on the posterior part of the right parietal bone, separated from the living coverings of the head by a line of large flabby granulations, which, encircling the skull, cut off the denuded dead bone from the live integuments; included by this line were nearly the whole of the two parietal parts of the frontal and occipital bones, the isolated portion of the scalp before alluded to, and a small piece of pericranium dry and shrivelled, closely resembling old parchment; with this exception the bones were perfectly bare, quite dry, and warm to the touch.

On the right parietal bone a fracture running parallel to the sagittal suture, and sending off a branch which crossed it, was distinctly to be seen.

The granulations bled on being touched, and exuded healthy-looking pus. There was a rather fetid odor.

Since the accident, she had not had a single bad symptom. She said “she would be all right if the head healed up, as the discharge annoyed her.”

The fits had not recurred.

Tongue was red, dry, and glazed down the middle; stomach rather irritable; pulse about 90 to 95, and weak; bowels inclined to be costive; appetite tolerable. She came to my house weekly, till the 7th of November, during which time the process of separation went on gradually.

On the 17th of November I was sent for, to see her for the first time in her own house, and found that while her sister was washing

the head, it being stooped over a basin, the calvarium had glided over her face into the vessel, leaving bare the dura mater, covered with healthy looking granulations, and perforated with three or four small holes, through which the brain substance could be seen. The portion of bone which came away consists of a small piece of the frontal, almost the entire of the two parietal, and a bit of the occipital bones. It measures seven inches from before backwards, and nearly five from side to side at its broadest part. (It is now in the museum of the Adelaide Hospital.)

The raw surface left exposed has healed up wonderfully, and is at present almost entirely skinned over. The tongue has become quite healthy in appearance, the pathway down the centre being gone. The pulse has fallen to about 75, and got soft and full; the appetite greatly better; and the appearance of the patient is improved. She has picked up flesh, and is able to go about the house, and is only kept in by the inclemency of the weather.

She suffered a good deal from neuralgia, whilst the bones were separating. The treatment was very simple, a weak solution of chloride of lime to the ulceration, and some pills to keep the bowels regular. After the calvarium came away, at first simple dressing, then weak citrine ointment (1 part to 8,) and touching the granulations once or twice a week with nitrate of silver. Good nourishing food and exercise in the open air, whenever the weather permitted, were ordered; all stimulants were strictly forbidden.

When only a portion of the bone had separated, a distinct pulsation could be seen, but when they came away entirely, I could perceive none.

Here is an injury which *a priori* would have been judged necessarily fatal. The extensive lesion over a cavity containing so delicate an organ as the brain, complicated by a blow, causing a fracture, the exfoliation of so large a portion of the skull, and the cicatrizing of the raw surface underneath, I believe to be unprecedented.

The entire absence from first to last of a single bad symptom.

The cure of the epilepsy of ten years duration.

A sensation of lightness and giddiness which was felt after the bones came away, disappearing as the wound healed, owing to the contraction of the cicatrix, compensating for any pressure that may have been lost, is worthy of remark.—*Dublin Quarterly Journal of Medical Science for February, 1869.*

THE GYNÆCOLOGICAL SOCIETY, of Boston, has been lately formed for the purpose of advancing the Study and Treatment of the Diseases of Women. Its founders are George H. Bixby, Samuel L. Dutton, H. M. Field, Winslow Lewis, John C. Sharp, Horatio R. Storer, Levi F. Warner, and William G. Wheeler, and the officers for the year, are Winslow Lewis, President; Horatio B. Storer, Secretary; and George H. Bixby, Treasurer. The members are required to be graduates in medicine, having an interest in Gynæcic Science and Art, and are bound by the Code of Ethics of the American Medical Association. The active members are assessed ten dollars annually, two-thirds of which are expended, by a Committee, for gynæcological journals and books of recent dates, especially those published in foreign languages, which are circulated among the members in turn, and of which abstracts are to be presented to the Society periodically.

Professor Storer announces his fifth private course on the Treatment of the Surgical Diseases of Women, with illustrative operative instruction, to be delivered during the first fortnight in June next, at the Franciscan Hospital for Women, in Boston.

COLLOID OF THE BRAIN.—M. Magnan presented, recently, to the Biological Society of Paris, preparations of colloid substance observed upon the surface of the brain of a patient who had yielded gradually to the progress of general paralysis. The colloid substance was located in the gray substance of the convolutions of the frontal and spheroidal lobes. It was opaline in color, and depressed the cerebral substance. It appeared in the form of small islets. Examined with the microscope, there were observed in it concentric disks of a brilliant opaline matter, studded with shining nuclei, and in the middle of the central disk, a capillary vessel with thickened walls was perceived. The nervous substance itself was altered in the same manner as the connective tissue; that is to say, it was shining like the nuclei. By comparative examinations of several

preparations M. Magnan has been led to think that the histological changes commenced in the nuclei, and invaded secondarily the nervous cells.

Treated with tincture of iodine and ether, these preparations preserved their primitive aspect. The alterations were, therefore, due neither to fat nor to starchy matter.—*Gazette Médicale, Paris.*

ASSOCIATION OF MEDICAL SUPERINTENDENTS OF INSTITUTIONS FOR THE INSANE.—The Secretary, Dr. Curwen, gives the following official notice:

The Twenty-third Annual Meeting of the Association of Medical Superintendents of American Institutions for the Insane, will be held in Staunton, Virginia, commencing at 10 A. M. of Tuesday, June 15, 1869.

At the solicitation of Dr. Stribling, the presidents of all the railroads in Virginia have agreed "that any member of our Association, who shall have paid full fare in attending the meeting, will be permitted to return over the same road free of charge."

There are two hotels in Staunton, about equally well kept and within 150 yards of each other. It might be that the members could be made more comfortable by dividing, and thus avoid crowding either.

Members leaving Washington or Baltimore in the morning will reach Staunton that day at 3½ P. M. by taking the cars of the Orange & Alexandria R. R., which connects at Gordonsville with the Chesapeake & Ohio Railroad going directly to Staunton.

HARRISBURG, March 30, 1869.

